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Monthly Message

In the Foreword to Colonel Duncan's book,[1] Brigadier General E. L. Munson, MC, USA, writes:

> "A procession of the ancient medical worthies who presided at the birth of our Nation is made to pass lifelike in review before us.
>
> "They move against a background that includes military situations and political conditions, as well as the state of medicine and surgery of the time. And as they pass, there seems a steady sequence of great professional figures that are outstanding— not only of great doctors, but of great doctors who become great generals in the field and great statesmen in the forum.
>
> "Every medical officer should read this book, not only for its historical value, but for the personal pride that must come to him from belonging to a Corps that from its very beginning has wrested honor and distinction from adversity. Civilian practitioners will likewise have a pride of membership in a profession that for more than a century and a half has sent of its best, in every emergency, for beneficent and humanitarian work under the colors."

Frank B. Berry

FRANK B. BERRY, M.D.
Assistant Secretary of Defense
(Health and Medical)

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1. DUNCAN, L. C.: *Medical Men in the American Revolution 1775–1783.* Army Medical Bulletin Number 25. Medical Field Service School, Carlisle Barracks, Pa., 1931.

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REMINDER: POLL OF READERS . . . . . June

Have you seen the June issue?

Foreword

The *United States Armed Forces Medical Journal* is a monthly publication of professional and administrative information for medical personnel of the Department of Defense. The Assistant Secretary of Defense (Health and Medical) and the Surgeons General of the United States Army, Navy, and Air Force invite members of the regular and reserve medical services, the professional consultants of the military departments, and other physicians and health scientists with an interest in Department of Defense activities to submit manuscripts for publication in this *Journal.*

FRANK B. BERRY, M.D.
Assistant Secretary of Defense

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UNITED STATES
Armed Forces Medical Journal

Experiment in Physical Examination of Retired Military Personnel

MAJOR GENERAL CLEMENT F. ST. JOHN, MC, USA
GUSTAV A. PAGENSTECHER, M.D.

A SIGNIFICANT TREND in present day Army medical care is toward an increase in outpatients and simultaneous reduction in inpatients. This is contrary to the trend in civilian hospitals, where increased insurance coverage has tended to increase hospital occupancies. Coping with the increased outpatient workload has sometimes placed a strain on Army facilities and personnel resources available for outpatient care. The effect upon personnel has posed a particular problem, because Army medical facilities are increasingly confronted by overspecialization, which has virtually eliminated general duty medical officers available for general practice.

Outpatient treatments at Brooke General Hospital have increased by about 10 percent between fiscal years 1957 and 1959. Records show 30,957 treatments monthly in fiscal year 1957, 32,195 in fiscal year 1958, and 33,644 in fiscal year 1959. Since there has been no corresponding population increase to explain this upward trend, it is more likely attributable to improved diagnostic and treatment regimens that now make it unnecessary to hospitalize many patients.

At one time routine appointments at this hospital were projected for almost a month. Obviously, this was a highly undesirable situation. Although patients who were really ill and acutely symptomatic were always seen in the emergency room, it became obvious that too many subacute "walk-ins" were also taking this recourse instead of waiting a month for their appointment. This intensified the problem by making the emergency room an area of general "sick call." It was imperative that the projection time for appointments be reduced to 7 days or less. Although some Army hospitals boast of a maximum

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From Brooke General Hospital, Fort Sam Houston, Texas. General St. John is now commanding general of Walter Reed Army Medical Center.

appointment projection time of 3 days, this fortunate balance of available physicians and outpatients has somehow not existed at this hospital.

In an attempt to solve this problem, it was suggested by one of us (G.A.P) that a group of specialists be concentrated on a one-day-a-month (or as indicated) basis for an annual physical examination of Brooke General Hospital's large retired officer population. This would remove a large segment of personnel from the appointment backlog of the general medical clinic, and would at the same time utilize specialists for examination and evaluation of patients requiring specialty care.

The plan was approved for a test on 2 April 1959. Three form letters were prepared: one to notify patients of their appointment, a second to notify them of negative results, and a third to notify them of any further appointments for follow-up of findings of the examination.

Personal data were pre-entered from outpatient records on examination forms. Complete outpatient records were also made available to examining physicians when indicated. A special mimeographed history form was prepared for each patient to complete before reporting to the examining station.

FIRST TEST

A total of 81 patients, including 4 dependents and 77 retired personnel, were examined during the first test. Prior to this date 84 appointment letters had been sent; 2 patients cancelled their appointments by telephone, so that only 1 patient from the entire group failed to respond. Service representation and status of patients examined during the first test were: Army, 47 officers, 11 enlisted men, and 4 dependents; Air Force, 10 officers, and 6 enlisted men; Navy, 2 officers, and 1 enlisted man.

The age ranges for dependent and retired personnel examined in the first test were as follows:

Dependents	*Number*	*Retired*	*Number*
16–21	2	30–40	2
22–60	2	41–50	12
		51–60	25
		61–70	31
		71–80	7

Of the 81 patients examined, there were 62 with complaints or ailments at the time of the examination, and 19 without complaints. Of the 62 with complaints, 21 showed no evidence of new disease or

increase in the established diagnosis. Of the 19 patients without complaints, 15 had no evidence of active disease. The 36 patients without evidence of active disease were dismissed. The remaining 45 examinees were referred to one or more of 14 clinics for further evaluation or follow-up, including 13 specialty clinics and the general medical clinic, as follows:

Clinic	*Number*	*Clinic*	*Number*
Allergy	1	ENT	8
Cardiac	5	Medical specialty	3
Chest	1	Orthopedic	5
Dental	33	Proctology	2
Dermatology	4	Surgery	5
Diabetic	1	Urology	3
Diet	2	General medical clinic follow-up	23

The general attitude of patients was excellent. They were impressed by the fact that a specialist was examining them. They felt that their examinations were thorough, and similar to those obtained when on active duty. No unfavorable comments were voiced.

As a result of the first test, the backlog of appointments in the hospital's general medical clinic was reduced by 4 days for each doctor on duty there. Although during this test its activities were curtailed somewhat, since it was necessary to use 3 clinic doctors to augment the staff of residents comprising the medical examining board, the general clinic continued to function.

SECOND TEST

Of the 77 patients scheduled, 69 were examined during the second test on 7 May 1959, including 4 dependents and 65 retired personnel. Two patients cancelled their appointments by telephone; another was hospitalized; only 5 patients broke their appointments without notification. Service representation and status of patients examined during the second test were: Army, 39 officers, 9 enlisted men, and 3 dependents; Air Force, 8 officers, 6 enlisted men, and 1 dependent; Navy, 3 officers.

Age ranges for dependent and retired personnel examined in the second test follow:

Dependents	*Number*	*Retired*	*Number*
15–21	3	30–40	3
22–40	1	41–50	13
		51–60	25
		61–70	20
		71–80	3
		81–90	1

Prior to the second test, hematologic examination, urinalysis and a chest roentgenogram were performed on each patient.

Of the 69 patients examined during the second test, there were 56 with complaints or ailments at the time of the examination, and 13 without complaints. Of the 56 with complaints, 14 showed no evidence of active disease. Of the 13 patients without complaints, 6 had no evidence of active disease. The 20 patients without evidence of active disease were dismissed. The remaining 49 examinees were referred to one or more of 17 clinics for further evaluation or follow-up, including 16 specialty clinics and the general medical clinic, as follows:

Clinic	*Number*	*Clinic*	*Number*
Chest	1	Neuropsychiatry	1
Dental	54	Orthopedic	8
Dermatology	7	Physical medicine	2
Diet	9	Proctology	4
ENT	7	Radioisotope	1
Eye	11	Surgery	8
Gastroenterology	4	Surgical vascular	1
Medical specialty	3	General medical clinic follow-up	11
Neurology	2		

Of the 42 patients with complaints or ailments on whom further evaluation was done, 15 were found to have no new disease or increase in their established diagnosis. One patient departed before receiving final clearance.

At the end of the second test, each patient was encouraged to comment in writing concerning his examination. More than 90 percent of the completed questionnaires were favorable. One common complaint was that a backlog, or prolonged delay, had occurred at one of the examination stations. This delay was eliminated in subsequent examinations. One patient complained of delay at the final clearance station. Investigation revealed that he, like many others, was slow in writing his comments about the examination, which delayed final check and clearance.

Since the resident staff comprising the examining board required only 1 doctor from the hospital's general medical clinic for only one-half the day during the second test, the clinic was able to function without significant curtailment. Upon completion of the second test, the backlog of appointments in the general medical clinic had been reduced by 2 days for each doctor on duty with the clinic.

The complete outpatient record for each patient was available at the final clearance station for reference during the second test. Examination forms with pre-entered personal data did not accompany the patient as in the first test, because this tended to slow examinations. Instead, an overprinted Outpatient Medical Record (DA Form 8–255),

roentgenogram, and laboratory reports were carried by each examinee as he progressed through the various stations.

The success of these first 2 annual examinations for male retired and dependent personnel encouraged trial-testing the same system for women. Accordingly, the first female examinations were planned for 4 June 1959, with one-half the day devoted to women and one-half to men. The same favorable results were obtained as in the tests for retired male personnel.

SUMMARY AND CONCLUSIONS

Routine physical check-ups and examinations for retired and dependent male personnel can be successfully accomplished by means of the medical examining board method. Two trial tests on male retired and dependent personnel, and a third test in which female personnel were included, demonstrated the feasibility of using assigned residents to decrease the outpatient workload, and to staff the medical examining board without detracting from the prescribed residency program.

The multi-station annual physical examination was well received by retired and dependent personnel, who felt that the method was both thorough and efficient.

TELLING THE PATIENT

The doctor must reply in some way to his patient's question regarding his blood pressure readings. Just what should the doctor tell the patient in order to satisfy him, to reassure him, and, above all, not to frighten him? How bound is the doctor to tell the patient the truth about each reading? Patients are accustomed to knowing, for example, the level of their hemoglobin concentration, and physicians do not hesitate to acquaint the patients with their progress in treatment of anemias by telling them how high or low the blood count is. . . . . The hypertensive patient, too, in spite of almost any explanations given him, will ultimately be most contented if he is told what his blood pressure readings are. The vast majority of patients assume that if the doctor does not want to give them the readings, it can only be because they are bad.—MILTON M. HURWITZ: A Practical Approach to the Diagnosis, Management, and Treatment of Hypertension. *The Journal-Lancet*, February 1960.

Percutaneous Needle Biopsy in Clinically Inoperable Pulmonary Tumors

LIEUTENANT COLONEL FRANK L. MILLER, MC, USA

TISSUE CONFIRMATION OF MALIGNANCY in pulmonary lesions that clinically appear inoperable for cure or palliation represents a difficult problem when bronchoscopic and scalene node biopsies are negative and no peripheral metastases are available for biopsy. Thoracotomy to obtain tissue for diagnosis is considered unjustified by many because, under the circumstances of inoperability, the procedure is formidable, hazardous, and nontherapeutic. Yet, histopathologic study of suspiciously malignant pulmonary tumors should be a prerequisite for radiation or chemical therapy, for without such study the validity of the diagnosis of malignancy must remain in question no matter how certain the clinical evidence.

Recording a 12-year experience at Memorial Hospital in New York, during which time 64 cases of pulmonary tumor were diagnosed by aspiration needle biopsy, Craver [1] pointed out that the procedure represented a safe and rapid method for diagnosis. Had it not been for Ochsner's [2,3] condemnation of the procedure, it seems likely that it would have been much more widely used in the years that followed. Ochsner contended that the possibility that the tumor might seed the pleura negated the usefulness of needle biopsy. Although it must occur, I have been unable to find a documented instance of clinical pleural or chest wall tumor implant following a needle aspiration or biopsy. Because of the manner in which a statement was made by Gledhill, Spriggs and Binford [4] in 1949, it has been accepted by many that Ochsner reported 2 instances of pleural tumor implant following needle biopsy. Ochsner's [3] report indicated that no needle biopsy was performed, and further, that the chest wall metastases in

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2 patients following pneumonectomy for carcinoma probably resulted from lymphatic spread rather than from seeding of the thoracotomy site at the time of operation. In a combined total of about 500 tumor biopsies, most of which were performed by the aspiration technic, Craver,[1] Gledhill and associates,[4] Burnett,[5] and Donohoe [6] reported no clinically evident implants along the needle tract. Burnett has noted 1 microscopic tumor implant on serial histologic sections of the needle biopsy tract.

A number of investigators [7-9] have made a diagnosis of pulmonary malignancy by means of pleural biopsy with the Vim-Silverman needle. In most of these cases the technic was used on patients with pleural thickening and pleural effusion of unknown cause.

The use of the Vim-Silverman needle offers a distinct advantage over the needle aspiration technic in that the tumor architecture is preserved in the core of tissue obtained. This is often not the case when dealing with tumor aspirates from which smears are made. This difference can be extremely important because organized tumor tissue will usually permit an absolute commitment from the pathologist, whereas aspirated tumor cells sometimes permit only a hedged or inconclusive diagnosis. It is very difficult to proceed comfortably in the management of a patient on the basis of a report reading "cells seem suspicious of malignancy" or even "cells seem highly suggestive of malignancy."

The purpose of this article is to describe an attempt to obtain histopathologic confirmation of the malignancy of pulmonary lesions in 10 consecutive inoperable patients by means of percutaneous biopsy with the Vim-Silverman needle. The study was undertaken in the hope that this infrequently used and generally misunderstood procedure could, in effect, spare each patient a diagnostic thoracotomy.

METHOD

Between January 1956 and July 1959, percutaneous biopsies with the standard Vim-Silverman needle were performed on 10 consecutive patients with clinically malignant pulmonary tumors. All patients exhibited 1 or more of the following criteria of inoperability: (1) phrenic nerve paralysis, (2) intrapulmonary metastasis, (3) osseous metastasis, (4) chest wall involvement, (5) pleural effusion, (6) vascular compromise, and (7) critical illness.

The location of the pulmonary tumor prior to biopsy was ascertained with the aid of posteroanterior, lateral, and apical chest roentgenograms, fluoroscopy, and at times laminagrams. With the

aid of metallic markers and a ball-point pen, land marks were transposed from these studies to the patient's chest wall. After skin preparation, local anesthesia, and a 3-mm cutaneous incision, a standard Vim-Silverman cannula with the obturator in place was introduced to the level of the tumor. The obturator was then withdrawn and the inner cutting needle inserted to its fullest extent through the cannula. The cannula was then moved forward 15 mm, overriding the inner cutting needle, the latter being held stationary. Both cannula and inner needles were rotated 360° in opposite directions. With external relationships of the cannula and inner needles maintained, both were simultaneously withdrawn. The core of tissue obtained was immediately placed in 10 percent formalin.

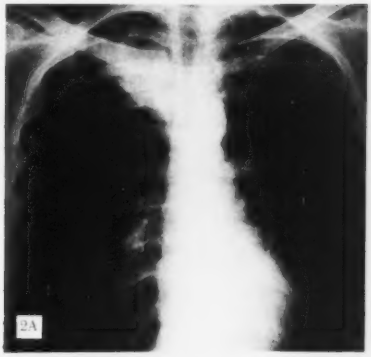
Postbiopsy monitoring included the recording of blood pressure, pulse, and respiratory rate every 15 minutes for 1 hour, and then every hour for 4 hours.

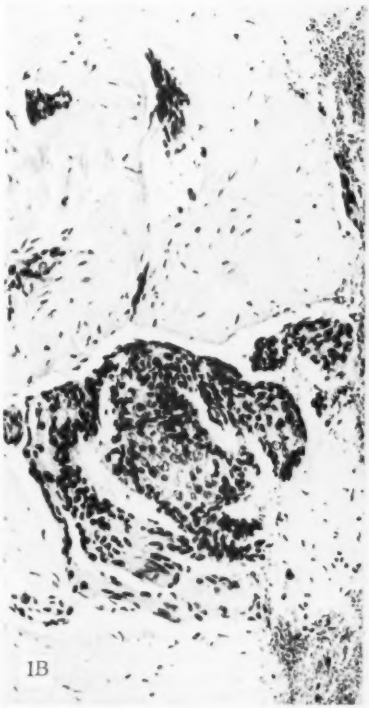
RESULTS

In all 10 patients of this consecutive series, the neoplastic nature of the pulmonary lesion was established pathologically by the tissue obtained with the Vim-Silverman needle biopsy. There were 3 complications: small, quickly resolving pneumothorax in 2 patients; minimal, transient hemoptysis in 1 patient. Brief reports on these 10 patients follow.

CASE REPORTS

CASE 1. A 40-year-old white woman had persistent pain in the right posterior part of the chest and lower back, which she first experienced in March 1955 after tripping over a clothesline, catching her chin on a garbage can, and hyperextending her body. Repeated detailed studies through November, including roentgenograms of bones and chest, revealed no apparent explanation for the discomfort. In early December shortness of breath developed, and on 9 December there was clinical and roentgenographic evidence of right pleural effusion. When seen in referral to the chest service on 26 January 1956, hospitalization was recommended. Past history revealed that in 1948 the patient had had carcinoma of the uterine cervix, treated by internal and external radiation, with subsequent follow-up every 6 months. The admission physical findings were those of fluid or pleural thickening in the right side of the chest. Roentgenograms of the chest confirmed the interpretation of the physical findings (fig. 1A). Gynecologic examination revealed only postradiation changes. Laboratory studies indicated a normal complete blood cell count and negative skin tests for tuberculosis, coccidioidomycosis, and blastomycosis. Histoplasmin skin test was positive. Lupus erythematosus cell preparation was negative. On the consideration that she most likely had metastatic tumor to the pleura, combined thoracentesis and pleural biopsy were performed. Smear and culture of the fluid failed to reveal fungi, *Mycobacterium tuberculosis* or other organisms, but Papanicolaou smears





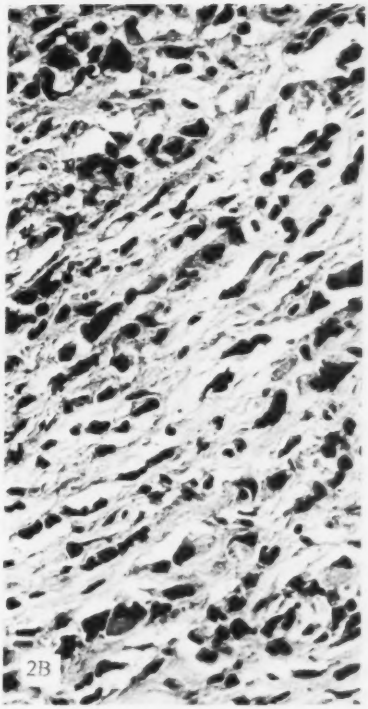


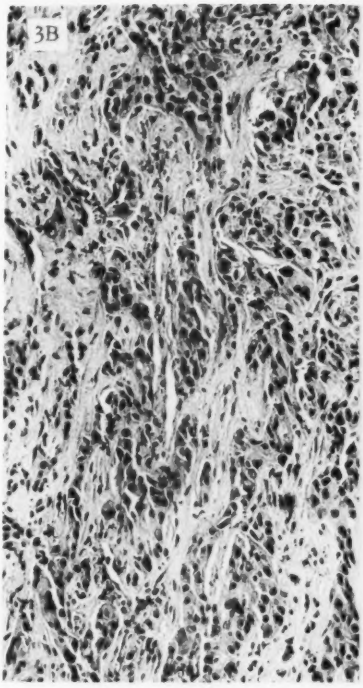
Figure 1 (case 1). (A) Pleural effusion from metastatic tumor. (B) Tissue obtained by needle biopsy. Epidermoid carcinoma, probably metastatic, from the cervix. (x 160) Figure 2 (case 2). (A) Paratracheal mass in upper lobe of right lung. (B) Tissue obtained by needle biopsy, consistent with anaplastic bronchogenic carcinoma. (x 350)

showed atypical cells. The needle biopsy revealed epidermoid carcinoma, metastatic, probably from the cervix (fig. 1B).

CASE 2. In early December 1955, a 55-year-old white man began experiencing occasional twinges of pain in the right infrascapular area. Between that time and the time of admission, 17 December 1956, the discomfort grew progressively worse and more constant, and was associated with a hacking cough and several episodes of minimal hemoptysis. He was hospitalized for evaluation when a roentgenogram, taken shortly before admission, revealed a lesion in the upper field of the right lung (fig. 2A). Physical examination revealed a thin, chronically ill white man who had lost approximately 25 lb in the preceding 12 months. Dulness to percussion and diminished tactile and vocal fremitus were present over the area medial to the right scapula. In addition to the pathologic lesion in the right lung, the admission roentgenogram revealed minimal elevation of the left leaf of the diaphragm, pleural thickening, and a circumscribed lesion in the left costophrenic angle. Survey of the skeleton disclosed no evidence of metastatic tumor. Skin tests for tuberculosis, coccidioidomycosis, histoplasmosis, and blastomycosis were all negative. Because it was considered that he had evidence of metastasis to the left lung, a Vim-Silverman needle biopsy of the lesion in the right lung was performed on 21 December, using a posterior approach. This yielded tissue consistent with anaplastic bronchogenic carcinoma (fig. 2B).

CASE 3. Cough and fever developed in August 1956 in a 40-year-old white man, stationed overseas. A roentgenogram of the chest was interpreted as normal, and the patient received a 7-day trial of oxytetracycline. In September he began to experience a dull, aching sensation in the left shoulder. In November, he was hospitalized because of discomfort, continuing cough, minimal shortness of breath, and weight loss of 17 lb. A distended venous pattern was found over the anterior left surface of the chest wall, and a roentgenogram of the chest revealed a paratracheal density on the left (fig. 3A). Bronchoscopic findings were normal. The patient was returned to the United States, arriving at this hospital on 20 December. Here, in addition to the previously described findings, the left leaf of the diaphragm was found to be immobile and elevated; and in the left supraclavicular area, there was a 1-cm by 2-cm movable node, which when excised showed only reactive hyperplasia. In the absence of metastatic sites for biopsy, and because of negative bronchoscopic findings and evidence of phrenic nerve compromise, a Vim-Silverman needle biopsy through the first anterior interspace was performed on 15 January 1957. The core of tumor tissue obtained was consistent with poorly differentiated squamous cell bronchogenic carcinoma (fig. 3B). The tumor was 3 cm below the biopsy site and not contiguous with the chest wall. The small traumatic pneumothorax that occurred underwent rapid, spontaneous resorption.

CASE 4. A 44-year-old white man was well until about November 1956 when morning cough productive of white mucoid sputum developed and loss of weight was noticed. There was no chest pain, hemoptysis, night sweats, or orthopnea. As part of an annual physical examination on 26 March 1957, a roentgenogram of the chest revealed a paratracheal mass on the right and a circumscribed nodular density in the right midlung field. The patient was seen in the medical chest clinic at this hospital and hospitalized on 3 April 1957, for further evaluation. His physical examination was essentially normal. Routine laboratory studies were also normal. Sputum specimens revealed atypical cells suggestive of malig-



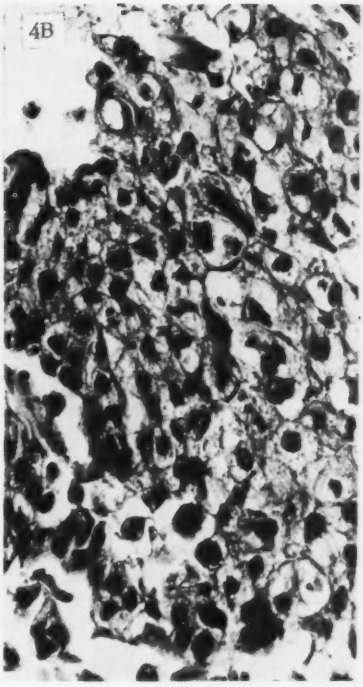


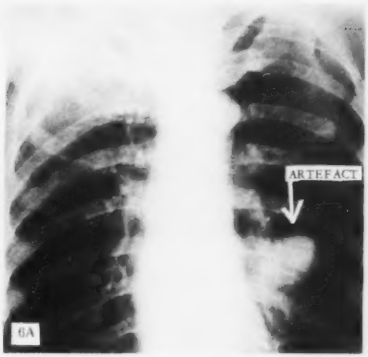
Figure 3 (case 3). (A) Paratracheal mass on the left and elevation of left leaf of diaphragm. (B) Tissue obtained by needle biopsy, consistent with poorly differentiated squamous cell bronchogenic carcinoma. (x 160)
Figure 4 (case 4). (A) Paratracheal mass on the right and nodular density in middle lobe of right lung. (B) Tissue from paratracheal mass, obtained percutaneously with Vim-Silverman needle, consistent with bronchogenic carcinoma. (x 350)

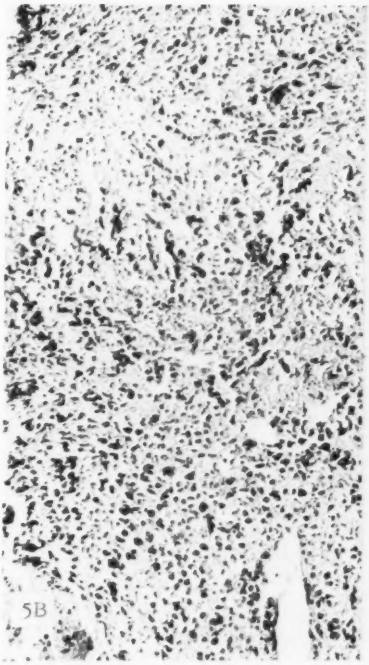
nancy, as did washings obtained at the time of bronchoscopy. Skin tests for tuberculosis, blastomycosis, and coccidioidomycosis were negative. The histoplasmin skin test was positive. Bronchoscopy on 10 April revealed a blunted carina and thickened, erythematous mucosa at the orifice of the right upper bronchus. A biopsy performed at this site revealed an inflammatory reaction but no tumor tissue. Because of this and because of the fact that there was radiographic evidence of intrapulmonary metastasis, a Vim-Silverman needle biopsy through the second right anterior interspace was performed, yielding tumor tissue consistent with bronchogenic carcinoma (fig. 4B). A chest roentgenogram on 30 April (fig. 4A) showed no change in comparison with that taken in March.

CASE 5. In December 1956, a 55-year-old white woman began noticing clubbing of the fingers and weight loss. A roentgenogram taken by her physician revealed a large lesion in the field of the upper left lung. She was admitted to this hospital on 24 May 1957, for further study. She had had no hemoptysis, sputum, fever, chills, pleuritic or chest pain, hoarseness, or wheezing, her chief complaint being progressive weakness. On admission the patient appeared chronically ill, had marked clubbing of the fingers and toes, and weighed 79 lb, having lost about 25 lb since January. A roentgenogram (fig. 5A) confirmed the previous finding. Otherwise her physical examination was within normal limits. Skin tests were negative for tuberculosis, coccidioidomycosis, and histoplasmosis. Complete blood cell count was normal. Bronchoscopic findings on 6 June were normal. Biopsy of left scalene node on 12 June showed only reactive hyperplasia. One of 6 sputum specimens yielded cells that were suggestive of malignancy. Because of the patient's extremely debilitated condition, she was not considered a candidate for diagnostic thoracotomy. On 28 June a percutaneous needle biopsy of the pulmonary lesion was performed, using a posterior approach through the left sixth intercostal space, where approximately 5 cm of lung separated the lesion from the posterior chest wall. Pathologically, the lesion was consistent with anaplastic bronchogenic carcinoma (fig. 5B).

CASE 6. An 82-year-old white man was well, except for pulmonary emphysema, until 2 months before admission to the hospital, when sharp knifelike pain developed beneath the right scapula. At outpatient evaluation, a roentgenogram of the chest (fig. 6A) revealed a density in the upper lobe of the right lung and osseous destruction of the fourth rib posteriorly. On admission, 13 June 1957, the patient was thin and emaciated, having lost approximately 25 lb in the past year. The diaphragm was hypomobile and abnormally lowered. Hyperresonance of the lung fields and an inconstant wheeze over the right hemithorax were present. Tenderness was noted over the posterior chest wall, centering about the fourth rib. The liver was palpable 5 cm below the right costal margin but not enlarged. Routine laboratory studies were normal. In view of this man's age, his poor condition, and the roentgenographic evidence of involvement of the chest wall and rib, a Vim-Silverman needle tumor biopsy was performed, yielding neoplastic tissue consistent with bronchogenic carcinoma (fig. 6B).

CASE 7. In 1954, a 41-year-old white woman had a right radical mastectomy for carcinoma. About 1 November 1958, she noticed the insidious onset of shortness of breath on exertion and sharp, sticking pain in the lower anterior chest on the right. Her physician believed that she had extensive pleural effusion on the right, and she was transferred to this hospital for further evaluation.





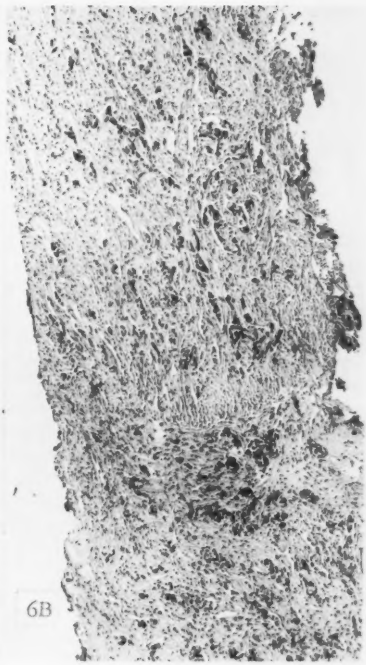


Figure 5 (case 5). (A) Large paratracheal mass on the left and minimal blunting of the left costophrenic angle. (B) Tissue from paratracheal mass obtained by needle biopsy, consistent with anaplastic bronchogenic carcinoma. (x 160) Figure 6 (case 6). (A) Tumor of upper lobe of right lung with partial dissolution of fourth rib. (B) Tissue obtained by needle biopsy, consistent with bronchogenic carcinoma. (x 52)

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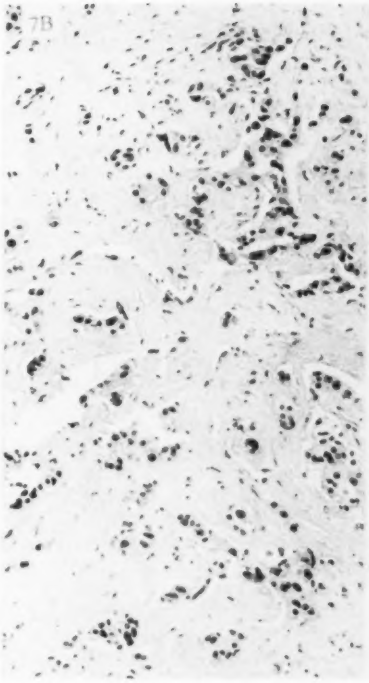
Physical examination on admission was normal except for moderate lymphedema of the right arm, a small lipoma of the forehead, right radical mastectomy scar, and evidence of pleural effusion or thickening in the right side of the chest. A roentgenogram on 8 December revealed pleural effusion on the right (fig. 7A). Skin tests were negative for histoplasmosis, coccidioidomycosis, and blastomycosis. A tuberculin skin test using second strength purified protein derivative produced a 5-mm area of induration. Concomitant with an attempt at thoracentesis on the right side, which yielded no fluid, a needle biopsy showed metastatic carcinoma to the right chest cavity (fig. 7B). The primary site was considered to be the previous breast carcinoma. After the biopsy, and on the following day, the patient coughed up 5 ml of hemorrhagic sputum. There was no subsequent bleeding.

CASE 8. On 30 May 1957, a 74-year-old white man had pain over the right costal margin, accompanied by vomiting, which continued for less than 12 hours. Similar episodes had occurred periodically over the preceding 8 years, and, on the basis of abnormal cholecystograms, were attributed to chronic cholecystitis. On 3 June the patient experienced sharp pain in the lower right side of his chest, aggravated by deep breathing, which became intense on the following day. On 5 June a roentgenogram showed minimal effusion in the right costophrenic angle. The patient denied cough, sputum production, hemoptysis, wheezing, hoarseness, fever, chills, and weight loss. On that day he was admitted to this hospital for further evaluation. Physical examination on admission was negative except for moderate obesity and dulness to percussion, diminished breath sounds, and deep inspiratory rales over the lower portion of the chest on the right. Skin tests were negative for coccidioidomycosis and positive for tuberculosis and histoplasmosis. The patient's temperature was 101.2°F and he continued febrile for the first 3 days of hospitalization. Rales persisted over the lower lobe of the right lung for approximately 12 days. Thoracenteses attempted on 12 and 17 June yielded no fluid. On 21 June a needle biopsy in the anterior axillary line produced tissue showing nonspecific inflammatory reaction. The patient was discharged from the hospital with a diagnosis of pleuritis, cause unknown, and was followed in the medical chest outpatient clinic.

The patient remained well until about the middle of April 1958, at which time sharp pain in the anterior chest on the right, pleuritic in nature, recurred. A roentgenogram revealed recurrent pleural effusion on the right. Admitted to the hospital for investigative studies, the patient again exhibited decreased breath sounds, dulness to percussion, diminished tactile fremitus, and fine inspiratory rales over the right lower portion of the chest. A thoracentesis performed on the day of admission yielded 690 ml of clear yellow fluid, the culture of which did not yield *Mycobacterium tuberculosis*, fungi, or pathogenic bacteria. Cytologic studies showed cells that were "suspicious for malignancy." Repeated subsequent attempts at thoracentesis on 25 April and 20 June yielded no fluid. A needle biopsy was not done. It was believed that, on the basis of the cytologic studies, this man had a pulmonary or pleural malignant tumor, but because of his age no further diagnostic studies were advised. He remained essentially well, but on 15 December a progress roentgenogram again showed pleural effusion on the right.

On 22 January 1959 the patient was again admitted to the hospital. A roentgenogram on 19 March showed extensive pleural thickening and effusion (fig. 8A). Thoracentesis yielded 550 ml of serosanguineous fluid. Needle



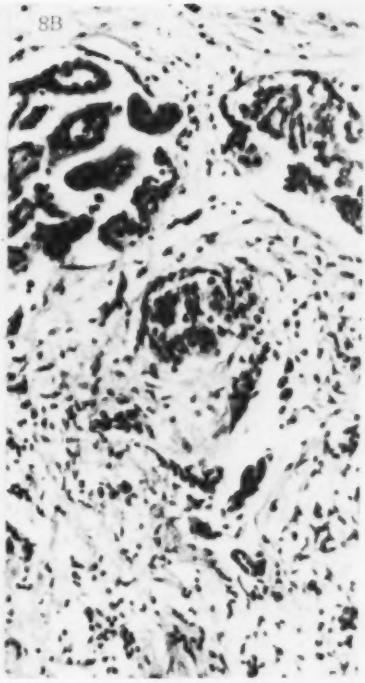


Figure 7 (case 7). (A) Pleural effusion on the right. (B) Tissue obtained by needle biopsy from right pleural space, showing carcinoma, probably metastatic, from breast. (x 160) Figure 8 (case 8). (A) Extensive pleural thickening and effusion on the right. (B) Tissue obtained by needle biopsy, consistent with poorly differentiated bronchogenic adenocarcinoma. (x 160)

biopsy produced tumor tissue consistent with poorly differentiated bronchogenic adenocarcinoma (fig. 8B).

CASE 9. A 48-year-old white woman sought medical attention early in January 1958 because of pain in the right upper abdominal quadrant. The pain had been intermittent over a 10-year period and was occasionally associated with pain in the right side of the chest and the right shoulder. She had been studied in the past for possible gallbladder disease, but no definite diagnosis had been made. She was hospitalized on 8 January, when a roentgenogram revealed an ovoid density lateral to the right hilum, measuring approximately 3 cm in greatest diameter, believed to be a granulomatous process because of apparent central calcification. Old films, dated August 1955, showed a nodule 2 cm in diameter in the same location. Bronchoscopy revealed a narrow, edematous orifice in the right upper bronchus and a stenotic right lower bronchus approximately 4 mm in diameter. Both histoplasmin and tuberculin skin tests were positive, and her lesion was considered to represent histoplasmosis. Cytologic examination of bronchial secretions and sputum specimens on 3 occasions was negative for malignant cells. The patient was discharged 24 January, to be followed at frequent intervals.

She remained essentially asymptomatic until 1 December, at which time pain, pleuritic in nature, developed in the right side of the chest and became progressively more severe. Because of the pain, the temperature elevation, and the night sweats, the patient was hospitalized on 8 December. A roentgenogram on 16 December showed pleural effusion on the right (fig. 9A). Physical examination revealed moderate splinting of the right hemithorax with decreased vocal and tactile fremitus, absent breath sounds, and flatness to percussion over the lower third of the right hemithorax. Thoracentesis yielded 1,250 ml of brownish turbid fluid, which was negative on culture and which showed atypical cells suggestive of malignancy.

The patient was transferred to this hospital on 21 January 1959 for further study. Her physical examination on admission was not significantly changed. On 28 January a needle biopsy of the pleura, performed concomitantly with a right thoracentesis, yielded tumor tissue consistent with undifferentiated bronchogenic carcinoma (fig. 9B).

CASE 10. In December 1956, a 78-year-old white man was found to have a nodular density, 1.5 cm by 0.7 cm in diameter, in the upper field of the left lung. No studies were made relevant to this lesion. On 3 April 1959, a roentgenogram of the chest taken for routine purposes during the course of an evaluation for transient weakness of both legs and an unsteady gait revealed that the previously described lesion had increased to 9 cm by 5 cm in diameter (fig. 10A). The patient was admitted to this hospital on 4 May 1959 for evaluation of this lesion. His chief complaint was dull, constant low backache made worse by coughing and deep breathing. For several years he had experienced exertional shortness of breath and on admission had a cough productive of approximately 5 ml of white mucoid sputum per day. He denied having ankle edema, paroxysmal nocturnal dyspnea, orthopnea, weight loss, loss of appetite, fatigue, hoarseness, dysphagia. Physical examination revealed an elderly man, who appeared poorly nourished and chronically ill. His chest was hyperresonant and the diaphragm was depressed and hypomobile. There was evidence of a left pleural effusion below the level of the third anterior rib. A roentgenogram of the chest on admission showed massive effusion on the left side, hemorrhagic on thoracentesis.

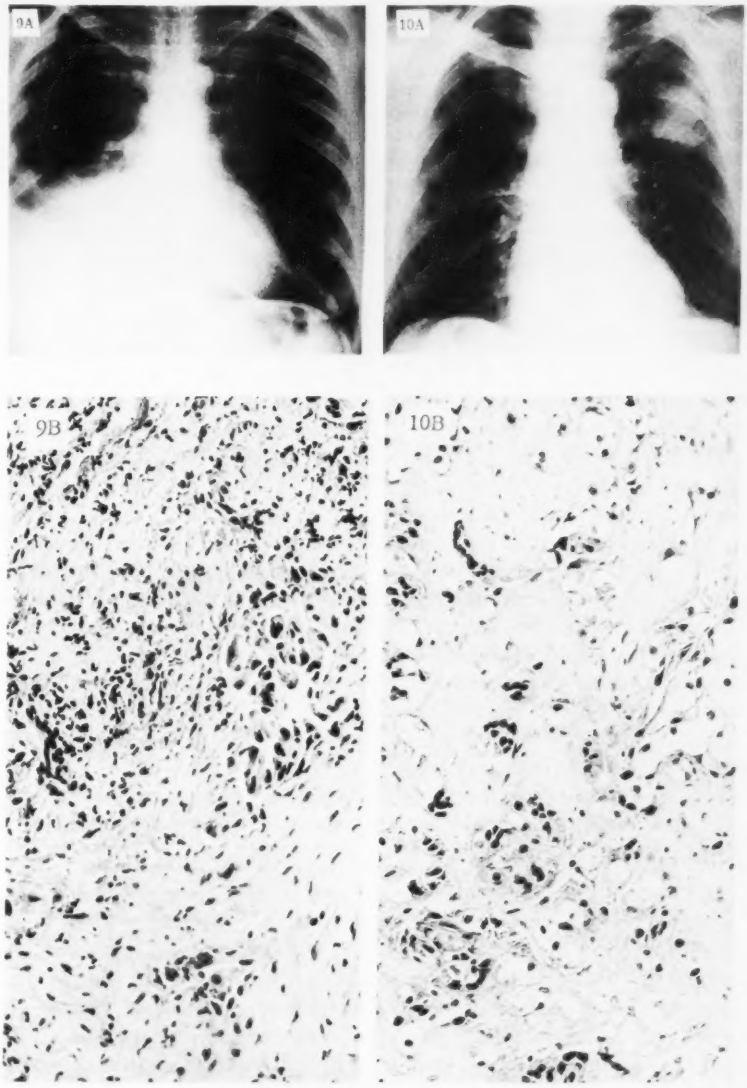


Figure 9 (case 9). (A) Pleural fluid and tumor of pleural cavity on right side. (B) Tissue obtained by needle biopsy, consistent with undifferentiated bronchogenic carcinoma. (x 160) Figure 10 (case 10). (A) Circumscribed lesion in upper lobe of left lung. (B) Tissue obtained by needle biopsy, interpreted as bronchogenic carcinoma. (x 160)

Cytologic examination of the fluid was negative. Two days after admission, bronchoscopic examination was normal. A blind biopsy at the left upper bronchus takeoff level revealed only chronic inflammation. Washings revealed atypical cells not considered diagnostic of malignancy. Concomitant with a thoracentesis on 18 May, a needle biopsy was attempted; the specimen obtained showed a small nest of cells suspicious, but not diagnostic, of malignancy. A repeat tumor biopsy with the Vim-Silverman needle on 3 June yielded tissue pathologically suspicious for malignancy. Needle biopsy repeated once more on 11 June produced tissue that the pathologist could readily call anaplastic carcinoma and that was interpreted as bronchogenic (fig. 10B). A small pneumothorax followed the second biopsy, but the lung expanded in 3 days' time.

DISCUSSION

The complications in this small series were gratifyingly few and relatively innocent. In 2 patients a small pneumothorax resolved quickly and spontaneously; and 1 patient experienced a small, transient hemoptysis. Major complications, such as massive intrapulmonary or intrapleural bleeding, were not expected but were prepared for in that the thoracic surgery service knew of the date and the time of the biopsies so that an emergency thoracotomy could be performed if indicated. The complications were less frequent than the noncardiac complications that occur with percutaneous catheterization of the left side of the heart. No tumor implants along the needle tract have been recognized clinically in this small series. Failure to obtain tumor tissue occurred in cases 8 and 10, although ultimately a successful biopsy yielded tumor tissue in each of these. In case 8, the first biopsy was unsuccessful because the tissue obtained did not show tumor; in case 10, the first 2 biopsies were failures in that the tissue obtained showed cells whose structural organization was not sufficiently distinct to permit the pathologist to make an absolute diagnosis of malignancy.

SUMMARY

Percutaneous biopsy of the lung was performed with a Vim-Silverman needle in 10 consecutive patients who had a clinical diagnosis of pulmonary tumor deemed inoperable for cure or palliation. The needle biopsy gave tissue confirmation of pulmonary malignancy in all 10 patients. This, in effect, exempted each from a diagnostic thoracotomy. There were 3 complications: in 2 patients a small, quickly resolving pneumothorax, and in 1 patient a small, transient hemoptysis.

With careful preparation, needle biopsy of lung tumors is relatively simple and safe. The procedure is of value in confirming the diagnosis of malignant pulmonary lesions clinically considered inoperable.

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WHO PRESCRIBES NEW DRUGS?

It is appalling to note the extent to which drug houses and patients now determine therapeutic practices. Neither is qualified for this role. Certainly the mother is not qualified to decide whether her child should receive an antibiotic for his sore throat, and the drug manufacturer is no more competent to decide, through a fixed-ration mixture, the relative doses of two or more drugs to be administered to a given patient. Drug advertisements and detail men can be useful sources of information in the harassing process of keeping up with new developments in drug therapy. However, if one does not have the time, the facilities or the inclination personally to evaluate their wares, less harm will be done if they are ignored completely. Remember that advertising is advertising.—Mark Nickerson and John P. Gemmell: Doctors, Drugs and Drug Promotion, *Canadian Medical Association Journal*, April 1, 1959.

Review of 100 Abnormal S Profiles

MAJOR HAROLD S. KOLMER, JR., MC, USA
CAPTAIN WILLIAM LYSAK, MSC, USA

INTENDED PRIMARILY AS A MEASURE OF FUNCTION and not of specific defects, the physical profile serial system (PULHES) of the U.S. Army [1,2] should be utilized by medical officers examining recruits at induction stations to assess the positive potential for effective military duty, as well as the negative potential usually assumed by a history of disqualifying symptoms. An effort was made to determine whether this was actually the case for the S category, which refers to neuropsychiatric status or degree of emotional stability within the PULHES system. For this purpose, 100 trainees rated as S 2 or S 3, representing mild or moderate emotional problems, were re-evaluated shortly after induction and again early in their basic training cycle.

An S 1 rating implies average efficiency for military service whereas an S 4 rating implies nonacceptability because of a marked emotional defect. When an S 2 or S 3 profile alerts the commanding officer to a trainee's psychiatric difficulties, some modification of the training requirements may be necessary to accommodate the handicap. Such revision of the training schedule, crowded as it is with subject matter required for effective training within the limited 8-week period, is a task that company commanders are reluctant to undertake. Therefore, any revision of the original S 2 or S 3 profile in the direction of an S 1, reducing the need for training schedule changes, is desirable from the viewpoint of both the company commander and the trainee.

METHOD AND RESULTS

The evaluation conducted in 1958–59 at the Mental Hygiene Consultation Service (MHCS) at Fort Carson, Colorado, then a large basic training post, was intended to assess the potential for effective

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functioning during the basic training cycle. The fact that the project was undertaken in addition to the usual MHCS service functions accounts for some of the limitations of the research design.

Arrangements were made, through the Division and Post surgeons and through the Trainee Processing Center, for all trainees with an S 2 or S 3 rating to be scheduled during a given period for a further MHCS evaluation, until a consecutive sample of 100 men was obtained. Typically, a trainee was scheduled to be re-evaluated during the week before beginning his 8-week training cycle or during his first to third week of training. In 4 instances interviews occurred during the fourth week of training and in 1 instance during the fifth week.

Table 1. ***Revision of S category ratings of the physical profile serial system assigned 100 trainees at induction***

Initial S rating (Induction station)	*Revised S rating (MHCS)*	*Number*
S 3	S 4	0
S 3	S 3	0
S 3	S 2	21
S 3	S 1	25
S 2	S 4	0
S 2	S 3	0
S 2	S 2	22
S 2	S 1	32

Upon arrival at the MHCS, the trainee was interviewed and evaluated by 1 of 2 psychiatrists, by the clinical psychologist or, in a few instances, by the psychiatric social work officer. The medical record and relevant life history of the patient were reviewed. Then his current mental status and apparent motivation for service were assessed, insofar as these could be determined in a rapid clinical evaluation usually requiring less than a half hour. On the basis of this quick appraisal, if a change in the initial S rating seemed warranted, the change was promptly made through appropriate medico-administrative channels. These evaluations were performed by experienced clinicians who had had considerable opportunity to become acquainted with the demands of basic training and with the ability and motivation required of trainees to fulfil them.

Of the 100 trainees, 46 were rated S 3 at induction and 54 were rated S 2. After evaluation at the MHCS, 21 of the S 3's were revised

to S 2 and 25 were revised to S 1; of the S 2's, 22 were left unchanged and 32 were changed to S 1 (table 1). No trainees were given numerically higher ratings (that is, more maladjustment) than those estimated at the induction station. Twenty-two (22 percent) of the ratings remained unchanged. Seventy-eight (78 percent) were revised in the direction of normality by numerically lower ratings.

When revision of the S rating was performed, a prediction of subsequent performance during the remainder of the basic training cycle was also made and recorded in terms of *no* difficulty in basic training anticipated, *some* difficulty anticipated, and *grave* difficulty, probably requiring separation, anticipated. At the end of the 8-week basic training cycle, the trainee returned to the MHCS for interview. This time, in a brief interview, an enlisted social work specialist rated the soldier's actual performance—his adjustment and degree of success in training. Collateral information concerning the trainee's performance was also obtained from his unit by telephone.

Table 2. ***Predicted performance compared with actual performance during basic training of 100 trainees***

Predicted performance	*Actual performance*		
	No difficulty	*Some difficulty*	*Grave difficulty*
No difficulty	56	2	0
Some difficulty	26	8	2
Grave difficulty	1	3	2

The data (table 2) reveal that 66 percent of the trainees performed exactly as predicted, 30 percent performed better than predicted, and only 4 percent performed worse than predicted.

DISCUSSION

The implication of these data is that the S ratings assigned at induction centers are grossly inaccurate and unduly pessimistic, when compared to the inductees' actual abilities and success in withstanding the rigors of basic training. Even the evaluators at the MHCS—who are usually more familiar with the physical and psychologic environment of the basic trainee than the induction station medical officer, and whose clinical evaluation of emotional stability is more extensive than that possible at induction—are unnecessarily pessimistic in rating the

potential for effective military duty of the basic trainees. These findings suggested that, for all practical purposes, the induction station physician is not properly equipped—and should not be expected—to assign S ratings other than S 1 or S 4, signifying acceptance or rejection. According to this study, if the inductee is not denied access to the service by reason of major emotional illness, he has a 96 percent chance of completing basic training adequately and without limitation of duty.

Since the completion of this study, information has reached the authors [3] that (1) the experience reported here had been consistent with that at several other Mental Hygiene Consultation Service units in the country and that (2) as a result of these combined observations, appropriate administrative changes were made as of March 1959 to grant an S 1 profile rating to all inductees who are acceptable for military duty.

SUMMARY

One hundred trainees assigned an S 2 or S 3 rating in their physical profiles at induction centers were re-evaluated at the Mental Hygiene Consultation Service of a basic training center. Almost 80 percent received too high an initial S profile rating, unnecessarily alerting commanding officers to their psychiatric abnormalities and implying a need for modification of training demands. Predictions of degree of subsequent success during basic training on the basis of the re-evaluation were largely borne out by the group's actual performance. This study suggested that, if accepted, the inductee stands a better than 9 to 1 chance of completing basic training and induction station medical officers, more often than not, may accept or reject an inductee on the basis of present potential for effective military duty, rather than of previous psychiatric disability. The validity of these findings is borne out by a recent administrative decision to grant an S 1 profile rating to all inductees acceptable for military duty.

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Present Status of Smallpox Vaccination

A Review

CAPTAIN PETER J. BATTEN, MC, USAR

IMMUNIZATION OF MAN against smallpox has been practiced for more than 2 centuries. Scrapings from lesions of individuals with mild cases of smallpox were used originally,[1, 2] but this procedure (variolation) was modified during the late eighteenth century when, in 1798, Jenner[3] demonstrated that previous cowpox infection, naturally acquired or artificially introduced into the skin (vaccination), afforded a high degree of protection from smallpox. Vaccination, far safer than variolation, has replaced the latter for purposes of immunization against smallpox.

The material in present-day vaccine is vaccinia virus. Its origin is uncertain. Some authorities [4–6] consider it to have been derived from cowpox virus, whereas others [1, 7–10] believe it more closely related to variola virus. Today, 2 types of vaccine are in use: a calf-lymph vaccine and a chicken embryo-cultured vaccine. Both are available as glycerinated (heat-labile) or as lyophilized (heat-stable) preparations. Details of the technic of smallpox vaccination are available in numerous publications [1, 4–16] and will not be considered in this paper.

DEVELOPMENT AND PERSISTENCE OF IMMUNITY

Smallpox vaccination consists of deliberate introduction of living vaccinia virus into the skin of man. This produces a localized epidermal infection, with multiplication of the virus, thereby stimulating certain cells within the body to create specific antibodies against it. Antigenically vaccinia virus is very closely related to variola virus,[1, 2]

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and it is therefore presumed that the vaccinal antibody provides immunity from smallpox.

Several investigators [14, 17, 18] believe that viremia occurs during the early stages of uncomplicated vaccination, but this has not been confirmed by Kempe and his associates.[19] It has been established, however, that viremia does occur in certain complications of vaccination.[11, 19–22]

Although an attack of smallpox confers long-lasting immunity,[23] second attacks of the disease, though rare, do occur.[10, 24, 25] Vaccination also confers protection from smallpox, but is probably not effective for as long a period of time as naturally acquired immunity.[10] Smallpox may occur in vaccinated individuals[23–25] but is very unusual within a year following successful vaccination.[5, 19, 26] The duration of individual immunity following vaccination is variable, ranging from several months to many years. In areas where smallpox is now almost nonexistent, such as North America, revaccination every 3 years is probably sufficient to maintain mass immunity at a high enough level to preclude the possibility of a smallpox epidemic. This is the current practice of the U.S. Armed Forces in North America.[27] Revaccination every year, particularly in endemic areas, will maintain the immunity of most individuals at protective levels.

Marsden [15] has pointed out that there is very little evidence that can be used to estimate the duration of absolute immunity to smallpox following vaccination. His view is that "statistics relating to the incidence of smallpox in the successfully vaccinated are of higher value as an index of the protective power of vaccinia against smallpox than those showing the interval between successive successful vaccinations and revaccinations."

DETECTION OF IMMUNITY

Detection by Means of Cutaneous Reactions

Presence or absence of immunity following vaccination has customarily been measured by presence or absence of a visible cutaneous reaction. A negative reaction (no take) is generally conceded to represent an unsuccessful vaccination, from which no immunity results.[1, 4, 6, 8, 9, 11, 12, 28] The 3 types of positive reactions are: immediate (formerly called immune), accelerated (formerly called vaccinoid) and primary (formerly called vaccinia). Development of any of these 3 reactions is commonly thought to indicate a successful vaccination, with resulting immunity. This is not entirely true. It has long been known that the immediate reaction is merely an allergic

phenomenon, evidence of prior contact with vaccinia or variola virus.[6, 10, 29–31] This has necessarily modified its value as an indicator of immunity.

Accepted interpretations of cutaneous reactions are based upon the experience and study of many investigators.[6, 10, 12, 14, 15, 19, 23, 24, 26, 29, 30, 32] The criteria used in making these interpretations were: (a) mortality rates from smallpox in vaccinated and unvaccinated individuals; (b) relationship of smallpox mortality rate to the number and type of previous vaccinations; (c) relationship between smallpox mortality rate and the size of the vaccination scar; (d) correlation of the case fatality rate from smallpox and the length of time elapsing since previous vaccination; (e) type of reaction resulting from revaccination administered at varying intervals of time after a previous vaccination; and (f) ability of both living and dead vaccinia virus to cause the immediate reaction, even to the point of reproducing vesicular and pustular stages within the first 3 days following vaccination.

Although exact statistical proof is difficult to establish, these investigations have clearly demonstrated the efficacy of smallpox vaccination. The consensus of these studies is that:

1. A primary reaction indicates that prior to vaccination there was little or no immunity; following vaccination there is a high degree of immunity.
2. An accelerated reaction indicates that prior to vaccination there was partial immunity; following vaccination there is a high degree of immunity.
3. An immediate reaction is not a specific measure of immunity. Although this response occurs in highly immune individuals, it only indicates prior sensitization to vaccinal (or variola) protein or abortive virus propagation. This reaction may be caused by faulty vaccination technic, vaccine of diminished potency, inactivated virus, or by a high, protective level of immunity.
4. A negative reaction is not a measure of immunity nor does it increase one's resistance to smallpox. It usually results from faulty vaccination technic.

These 4 reactions are best distinguished from one another, according to most U.S. investigators, by the time required for development of maximal inflammation following vaccination.[5, 7, 11, 12, 28] In actual practice, however, it is difficult to perform daily readings of the reaction. Appearance and time of development of the various stages of the central lesion are used as criteria by many authorities.[1, 6, 8, 9, 15] Cross[33] has even been able to demonstrate that in primary vaccinations the size of the vesicle is directly related to the time of development of immunity. Since vesiculation and pustulation may be present on the second and third days, even after the administration of inactivated vaccine,[29, 30] one should not judge success or failure of immunization by morphology of the central lesion without reference to the time after vaccination.

Although responses to vaccination are differentiated into 4 types,

all gradations of reactions may be observed.[12, 19, 26] This wide variation is simply a reflection of the spectrum of infection, a phenomenon normally seen in all communicable diseases. Thus, classification of cutaneous reactions into the 4 specific types seems artificial. It seems best at present to accept only primary and accelerated reactions as successful vaccinations.[5, 14]

Detection by Means of Serologic Reactions

At least 6 different vaccinal antigens are known: [6] complement fixing, hemagglutinating, neutralizing, LS, NP, and X. It is generally thought that neutralizing (VN) antibody best represents resistance to smallpox,[4, 23, 34, 35] but because of technical difficulties, this test has seldom been used in the past. Antibodies to the other 5 antigens, though comparatively easy to detect, do not correlate as well with actual immunity, and probably have little significance in evaluating immunity from smallpox.[6, 35]

Until recently, serologic studies of smallpox vaccination were inconclusive because most investigators had used complement fixation (CF) or hemagglutination inhibition (HI) tests. Late in 1958, however, a team of British virologists demonstrated that there is no close relationship among VN, HI, and CF titers following either vaccination [35] or smallpox.[36] Their findings may be summarized as follows: [35] Antibody was first detected 13 days after primary vaccination. VN antibody was present in the majority of successfully vaccinated subjects, HI antibody was present in all, and CF antibody was present in less than half. VN antibody remained in many subjects for 20 or more years, HI antibody for about 14 months, and CF antibody for less than 6 months. In revaccinations the response of VN antibody was usually higher and occurred earlier than after primary vaccination. In a significant number of revaccinations HI and CF antibodies failed to appear, even though a marked increase of VN antibody occurred. About half of the subjects with an immediate reaction did not have an associated rise in VN antibody titer.

On the basis of these findings it becomes evident that certain conclusions of previous investigators cannot be accepted entirely. The extensive research of Collier and his associates,[18, 24, 25, 37–39] for example, is certainly limited by their use of the HI test alone, as they themselves admit. Many of their unexplained findings are clearly due to inadequate serologic technic. Other investigations [28–30, 40, 41] dealing with correlation between antibody level and type of skin reaction following vaccinations also suffer from the fact that no serologic test will tell us without any question whether or not a person is immune to smallpox.

FAULTY IMMUNE MECHANISMS

Investigations of children with hypogammaglobulinemia have yielded further information about the immune mechanism controlling vaccination, and have uncovered several unsolved problems. Gitlin, Gross and Janeway [42] recently observed that of 21 children with congenital agammaglobulinemia, 14 responded to vaccination with primary reactions; revaccination of this same group of children led to "immune" (immediate) reactions, "despite failure to form detectable serum (VN) antibodies." Apt [43] had earlier reported successful vaccination of similar children.

Many studies of the rare complications of vaccination—progressive vaccinia, eczema vaccinatum, and generalized vaccinia—have been concerned with the presence or absence of gamma globulin and vaccinal antibodies.[19–22, 44–50] The amount of gamma globulin in instances of these complications has varied from zero to normal. Vaccinal antibodies have been uniformly absent except in 1 child in whom studies [46] were performed after administration of hyperimmune vaccinal gamma globulin and may not reflect the pretreatment titer. Gitlin,[51] Kempe,[52] and Lewis and Johnson [47] have suggested that immune substances other than gamma globulin may be involved in these children.

All these investigations tend to support Collier's [18, 24] thesis that a distinction exists between cutaneous and humoral immunity, but further studies of this problem are needed.

SUMMARY

Successful vaccination provides a high degree of immunity against smallpox. At the present time it is best to rely on skin reactions as indication of the presence or absence of immunity following vaccination. These reactions can be assessed as follows:

a. Primary and accelerated skin reactions are evidence of successful vaccination from which immunity results. The duration of individual immunity is variable. Most subjects are probably protected for about 3 years, but it is safest to revaccinate every year in endemic areas.

b. An immediate skin reaction represents sensitivity to vaccinal (or variola) protein or abortive virus propagation. This reaction occurs in all subjects who are highly immune to smallpox at the time of vaccination. Since it may also occur in susceptible persons, all immediate reactors should be revaccinated in an effort to obtain a more intense response.

c. A negative skin reaction represents an unsuccessful vaccination from which no immunity results and should be taken as evidence of faulty vaccination technic. These subjects must be revaccinated until successful immunization occurs.

Cutaneous reactions are distinguished from one another by time required for development of maximal inflammation. The morphology and time relationship of various stages of development of the central lesion are of secondary importance for purposes of interpretation. Accurate interpretations must be based upon daily observation, a practice that is rarely feasible.

It is believed that neutralizing antibody best represents resistance to smallpox, although this has never actually been tested in the field. A recently developed accurate neutralizing test has revealed no close relationship between neutralizing, hemagglutinating, and complement-fixing antibody titers of vaccinated subjects.

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Medical Impairments and Military Effectiveness III

Performance and Disposition of Inductees with Diagnoses of Perennial Bronchial Asthma, Chronic Otitis Media, Epilepsy, Duodenal Ulcer, and Knee Joint Injuries

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PERENNIAL BRONCHIAL ASTHMA

THE SOLDIER who develops bronchial asthma in the Army, or who presents a history of bronchial asthma at the time of the preinduction medical examination, presents a real problem to the Army medical service. Statistics indicate that 6 of every 100 medical rejections at the preinduction examination are for asthma [12] and that a large number of asthmatic subjects are admitted to Army medical treatment facilities each year. The disposition of asthma admissions for the 6-year period 1950–55 inclusive indicates that about 1 out of 5 (20.3%) asthma patients admitted to Army medical facilities is subsequently given disability separation and that pollen asthma is appreciably less likely to result in disability separation than is perennial asthma.[13, 14] Inasmuch as asthma represents one of the leading causes of medical disqualification at the preinduction examination, the question frequently arises whether we should consider inducting men with asthma during a full mobilization, particularly since we are able to return a

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large percentage to duty status following treatment in hospital or quarters.

The question also frequently arises how or why so many asthmatic subjects are taken into the Army when entry standards preclude their acceptance. In many instances, the subject does not indicate on his preinduction report of medical history that he has previously had asthma, and there may be no positive physical findings to suggest a diagnosis of asthma at the time of medical examination. In other instances, when the preinductee indicates a positive history of asthma, the examining physician is unable to confirm by positive physical findings that the subject has asthma and directs him to obtain documentation from the attending physician. It is frequently difficult and sometimes impossible, however, for the young asthmatic sufferer to obtain this required documentation, particularly if he has moved frequently or does not have a regular family physician. Since documentation of the history of asthma must be required by the examining station to forestall attempts to avoid military service by false statements about asthmatic episodes, the asthmatic subject without such documentation may be inducted.

Table 18. ***Exposure to elements and duty days lost for medical reasons among successful inductees with perennial bronchial asthma. Percentage distribution***

Duty days lost	*Outside jobs*	*Inside jobs*
1–10	20	45
11–50	51	41
51 or more	29	14
Total (%)	100	100
Number in sample	51	42
Median duty days lost	42.8	27.5

Chi-square significance: $P = < .05$

Many military physicians recommend that soldiers with chronic asthma should avoid exertion that places heavy demands upon the respiratory or circulatory systems; environments that include outside work with no protection; sudden changes of temperature; excessive heat or cold; extremes of humidity; wet working conditions; abnormal air pressure; and exposure to irritants such as gases, vapors, dusts, and smoke. An attempt was made to classify as "inside" and "out-

side" the military jobs in which successful asthmatic inductees served, with a view to comparing the 2 types of jobs according to duty days lost for medical reasons (table 18). In the group of "successful" asthmatic inductees, that is, those who completed 24 months' obligatory military service, 51 job assignments could be classified primarily as outside work and 42 were primarily inside. Asthmatic soldiers in "outside" jobs lost significantly more days for medical reasons than did those in "inside "jobs.

A comparison of the dispositions of soldiers with perennial asthma in 1955 according to length of service (table 19) indicates that as a rule the longer an enlisted man has been in the service, the greater the likelihood of his being returned to duty upon release from an Army medical treatment facility. As will be pointed out later, this relationship cannot be attributed simply to an early "weeding out" of the more severe cases of asthma or indeed of most other disease entities discussed in subsequent sections of this report. Rather, the relatively low rate of duty dispositions from hospital or quarters in the first few months of service is believed to be associated with the observation noted by Sullivan and Hamilton[5] regarding duodenal ulcer that the disposition of subjects is influenced "by the patient, his motivation and emotional reactions, and the physician and his knowledge and attitudes . . . about the patient." This observation seems equally applicable to perennial asthma because careful review of the case histories reveals that the manifestations and symptomatology of the disease as recorded for the "unsuccessful" group seem no more severe or disabling than the recorded manifestations and symptomatology of the "successful" group.

Successful asthmatic inductees, compared as a group with the baseline sample of nonasthmatic successful soldiers, tended to have more sick-call visits, more duty days lost for medical reasons, and fewer promotions and decorations such as good conduct awards. Nevertheless, it should be pointed out that the majority of asthmatic soldiers completed their period of obligatory service and were promoted, and that about half of them received the Good Conduct medal. Furthermore, among successful asthmatic soldiers a significant relationship existed between promotions and duty days lost for medical reasons: 59 percent of the asthmatics who had 10 or less duty days lost during their 2-year Army service achieved a final grade of corporal or higher, whereas only 33 percent of those with more than 10 noneffective days reached the grade of corporal. Frequent or prolonged hospitalization may well cause a soldier to be passed over for promotion in favor of one who can be expected to be present for duty more regularly. Thus, the more time the asthmatic soldier spends in the hospital,

the less likely he is to be promoted to a position of increased responsibility. However, there was no significant relationship between duty days lost for medical reasons and award of the Good Conduct medal, suggesting that unit commanders do not hold hospitalization, as such, against a soldier even when it is prolonged or frequent.

Table 19. ***Disposition and length of service among Regular Army and AUS enlisted men sick in hospital or quarters with perennial bronchial asthma in 1955. Percentage distribution***

Disposition	*Length of service at time of admission*												
	Less than 3 months		*3 to 6 months*		*6 to 12 months*		*1 to 2 years*		*2 to 3 years*		*3 years or more*		*Total*
	RA	*AUS*	*RA*	*AUS*	*RA*	*AUS*	*RA*	*AUS*	*RA*	*AUS**	*RA*	*	*RA & AUS*
Duty**	54	47	67	68	72	78	84	86	90	58	90	–	81
Disability separation	32	32	24	18	20	14	7	9	6	29	7	–	12
Other***	14	21	9	14	8	8	9	5	4	13	3	–	7
Total (%)	100	100	100	100	100	100	100	100	100	100	100	–	100
Number† sick in hospital or quarters**	66	110	63	112	106	201	176	255	185	24	729	–	2,027

Source of data: machine data cards furnished by Medical Statistics Division, OTSG.

*AUS soldiers normally serve only 24 months.

**Weighted to equalize 50% sample of "duty" dispositions with 100% sample of "disability" and "other" dispositions.

***Includes administrative separation, duty pending disability or administrative separation, and transfers to non-Army hospitals.

†Since multiple admissions or diagnoses for 1 soldier are counted as separate admissions, number of admissions is greater than number of soldiers involved.

Under present training concepts, all soldiers are required upon entry into the service to undergo basic combat training, during which they are exposed to long hours of training, heavy exertion, all kinds of weather, and usually a great deal of dust—conditions that frequently precipitate asthmatic attacks. If asthmatic soldiers are inducted, it seems probable that practically all who have perennial asthma and undergo basic combat training will require some modification of the training schedule, or will have to be rephased to subsequent cycles of training to make up the instruction missed while in hospital or quarters status. If the soldier with perennial asthma can successfully complete basic combat training, there are many jobs he can perform in a suitable environment in the military service.

CHRONIC OTITIS MEDIA

Statistics for the period 1950–52, inclusive, indicate that 4.9 of each 100 medical rejections at Armed Forces examining stations are for otitis media, with or without hearing loss.[12] Despite the screening made at the preinduction medical examination, a large number of soldiers are admitted annually to Army medical treatment facilities with chronic otitis media, and a larger number are treated for the same disease as outpatients. The disposition of soldiers who acquire chronic otitis media within the military service, or who have a reactivation of middle ear disease antedating entry into the service, is dependent upon the severity of the condition and the circumstances involved. Most soldiers who acquire otitis media within the military service are returned to duty status regardless of service connection and complete their obligatory period of military service. Of the "successful" inductees, 73 (54%) indicated at the time of the preinduction examination that they had had ear trouble.

In the "successful" sample, 86 military jobs were classified primarily as "outside" work, and 48 as "inside." Inductees with chronic otitis media who worked in an "outside" environment had appreciably more duty days lost for medical reasons than did those who worked at "inside" jobs (table 20).

Table 20. ***Exposure to elements and duty days lost for medical reasons among successful inductees with chronic otitis media. Percentage distribution***

Duty days lost	*Outside jobs*	*Inside jobs*
1-10	38	48
11-30	19	29
31 plus	43	23
Total (%)	100	100
Number in sample	86	48
Median duty days lost	23	12

Chi-square significance: $P=<.05$.

A comparison of the dispositions for all chronic otitis media admissions for 1955 by length of service (table 21) indicates that the longer an enlisted man has been in the service, the greater his likelihood of returning to duty upon release from an Army medical treatment facility. The proportion returned to duty following admission for

chronic otitis media increased steadily from approximately 40 percent of those with less than 3 months' service, to approximately 90 percent of those with 1 to 2 years of service. There were no significant differences between the proportions of Regular Army and AUS enlisted men returned to duty from each length of service category.

Table 21. ***Disposition and length of service among Regular Army and AUS enlisted men sick in hospital or quarters with otitis media in 1955. Percentage distribution***

Disposition	*Length of service at time of admission*												
	Less than 3 months		*3 to 6 months*		*6 to 12 months*		*1 to 2 years*		*2 to 3 years*		*3 years or more*		*Total*
	RA	*AUS*	*RA*	*AUS*	*RA*	*AUS*	*RA*	*AUS*	*RA*	*AUS**	*RA*	*	*RA & AUS*
Duty**	40	42	57	51	74	88	88	90	93	(6)	89	–	78
Disability separation	54	54	28	40	17	11	7	4	4	(2)	8	–	17
Other	6	4	15	9	9	1	5	6	3	–	3	–	5
Total (%)	100	100	100	100	100	100	100	100	100		100	–	100
Number*** sick in hospital or quarters**	81	80	53	63	105	111	123	209	75	8	303	–	1,211

*AUS soldiers normally serve only 24 months.

**Weighted to equalize 50% sample of "duty" dispositions with 100% sample of "disability" and "other" dispositions.

***Since multiple admissions or diagnoses for 1 soldier are counted as separate admissions, number of admissions is greater than number of soldiers involved.

The logic of an earlier statement concerning the relationship between length of service and separation may be questioned, on the argument that those with more severe cases may have been eliminated earlier. Experience with the 61 soldiers actually separated for disability indicates that 47 of them had mild or moderate chronic otitis media and only 14 had "severe" otitis media that did not meet retention standards. None of those with severe otitis media were separated in the first 6 months of service; 52 of the 61 separations occurred at basic or advanced training centers, 23 of them at one basic training center alone. This disproportionate separation rate cannot readily be accounted for on the basis of environmental conditions or type of training encountered, number of soldiers processed through the centers, or severity of the disease. Rather, these findings suggest that either the soldier's motivation was poor, or that local policies,

rather than existing retention standards, strongly influenced the separations for chronic otitis media.

It was noted that a number of subjects who gave a history of chronic otitis media at their preinduction examinations did not have recorded audiometric examinations and, when audiometric examination was performed later, were found to have significant hearing loss. It is considered desirable that every preinductee have his auditory acuity tested with an audiometer as a routine procedure. The argument is sometimes advanced that time at the Armed Forces examining stations does not permit such evaluation. There is no question that audiometric examination is time consuming. It is believed, however, that if such an examination is performed routinely, it will assist in better utilization of acceptable inductees and in identification of many preinductees who would otherwise have to be separated at a later date because of deafness, the most common complication of chronic otitis media that leads to separation.

Successful inductees with chronic otitis media, those who completed their 24-month obligatory military service, compared as a group with the baseline sample of inductees, tended to have more sick-call visits, more duty days lost for medical reasons, and fewer promotions and decorations such as the Good Conduct medal. It should be noted, however, that the majority of chronic otitis media inductees completed their period of obligatory service and were promoted, and that over half of them received a Good Conduct medal.

PAROXYSMAL CONVULSIVE DISORDERS (EPILEPSY)

Recruiting regulations in effect in 1814 specified that "all recruiting officers are forbidden to enlist any man . . . known to have *epileptic fits* . . . and any officer who shall enlist such man and any surgeon or mate who shall certify to his fitness for service, shall on proof thereof, be dismissed from the service." [15] The policy of not accepting known epileptics continued until 1948, when entry standards[16] were modified so that subjects with paroxysmal convulsive disorders—grand mal, petit mal, and psychomotor epilepsy—that were controlled by medication were acceptable for enlisted and inducted service. Persons who give a history at the preinduction examination of epilepsy not controlled by medication of a standard type continue to be unacceptable for military service.

Statistics for the period 1950–53, inclusive, indicate that 1.1 percent of medical rejections for military service at the Armed Forces examining station are for uncontrolled epilepsy.[12] Despite the screening

made at Armed Forces examining stations, a large number of soldiers with epilepsy are admitted annually to Army medical treatment facilities. The disposition of these soldiers is dependent upon the adequacy of control and the circumstances involved. Most soldiers admitted to an Army medical treatment facility with epilepsy are returned to duty status. For example, during the 6-year period 1950–55 inclusive, there were 6,184 admissions for epilepsy. Of those admitted during this period, 2,024 (32.7%) were separated by reason of disability. Although high, the proportion of separations in more recent years seems to be showing a downward trend; 37.5 percent of admissions for epilepsy were separated during the period 1950–53, 22.1 percent were separated in 1954, and only 19.7 percent were separated in 1955.[13, 14]

It is extremely difficult for physicians at Armed Forces examining stations to determine when a given applicant is adequately controlled or even to ascertain that the subject has epilepsy. Experience with this group of epileptics indicates that the applicants frequently conceal the fact that they have had previous convulsions and minimize the frequency of convulsions or the degree of control, presumably in order to be accepted for military service. Soldiers in the "successful" group seemed extremely well motivated as a group and appeared to have a good understanding of their disease. This motivation may be related somewhat to the belief expressed by 2 soldiers in the sample that if an epileptic has successfully completed a tour of military service, he can usually obtain a civilian job without prejudice because of his disease.

A review of the individual records of the "unsuccessful" soldiers with epilepsy indicates that failure to achieve control of the disease in 7 instances was due to lack of cooperation on the soldier's part. In 16 cases soldiers did not have the opportunity for adequate trial of duty to see whether or not control could be achieved, but upon admission to an Army medical treatment facility were immediately separated from service without treatment. In 21 instances there was evidence of an associated character and behavior disorder, which probably influenced the decision of the medical officer to separate the soldier from the service. In the unsuccessful group 10 soldiers had an adequate trial of duty but the disease could not be readily controlled.

The question is frequently asked, "When is a subject with epilepsy satisfactorily controlled?" When considering whether a soldier should be retained in the service, satisfactory control of epilepsy is defined as "freedom from seizures of any type on a therapeutic regime in which the cooperation of the member has been fully extended. Neither controllability nor lack of controllability should be assumed until

there has been a suitable period of time for observation."[17] In recent years, soldiers who require prolonged observation to achieve control are usually followed on an outpatient basis. When it is apparent that failure to achieve control results from lack of cooperation or is caused by and exclusively related to the use of alcohol, the soldier frequently is separated for administrative rather than medical reasons, because of defective attitude, shirking, or unsuitability, as the case may be. Those whose epilepsy can be controlled only by drugs so toxic as to require frequent clinical and laboratory follow-up are not knowingly accepted for or retained in the military service.[17,18]

Table 22. ***Disposition and length of service among Regular Army and AUS enlisted men sick in hospital or quarters with epilepsy in 1955. Percentage distribution***

Disposition	*Length of service at time of admission*												
	Less than 3 months		*3 to 6 months*		*6 to 12 months*		*1 to 2 years*		*2 to 3 years*		*3 years or more*		*Total*
	RA	*AUS*	*RA*	*AUS*	*RA*	*AUS*	*RA*	*AUS*	*RA*	*AUS**	*RA*	*	*RA & AUS*
Duty**	47	25	42	35	67	63	82	83	81	(10)	89	–	72
Disability separation	35	46	44	39	19	25	10	10	11	(4)	4	–	16
Other	18	29	14	26	14	12	8	7	8	(3)	7	–	12
Total (%)	100	100	100	100	100	100	100	100	100		100	–	100
Number*** sick in hospital or quarters**	55	24	43	57	80	83	139	111	74	17	255	–	938

*AUS soldiers normally serve only 24 months.

**Weighted to equalize 50% sample of "duty" dispositions with 100% sample of "disability" and "other" dispositions.

***Since multiple admissions or diagnoses for 1 soldier are counted as separate admissions, number of admissions is greater than number of soldiers involved.

Among the admissions of epileptic men, it was noted that the longer an enlisted man had been in the service, the greater the possibility of his being returned to a duty status (table 22). This trend probably occurs because after 1 year of military service the soldier is trained for a military job and because a large percentage of those with associated character and behavior disorders have been previously eliminated. The trend does not appear to be related to the severity of the disease process in the majority of instances.

The assignment of a soldier who had epilepsy did not pose any particular problem after the disease was diagnosed by the medical

officer and reported to the personnel officer. The most frequent restrictions made by medical officers were to avoid driving vehicles, working on high places or around moving machinery, or performing any duty that would endanger his life or the lives of others should he have a lapse of consciousness. In the "successful" sample 6 soldiers were assigned as drivers of government vehicles before epileptic convulsions occurred in the service. Two of these had convulsive seizures while driving and wrecked their vehicles but received only minor personal injuries. Of 3 soldiers in the "successful" group assigned as cooks, 1 almost fell against a hot stove during a convulsion and would have been seriously burned had it not been for the quick response of a soldier nearby. In some instances the medical officer did not impose assignment restrictions after discovery of the convulsive disorder. If the epileptic soldier conceals his disability, as many epileptics do, and if the medical officer fails to recommend assignment restrictions, or if the unit commander fails to honor the recommended restrictions, it can easily happen that the epileptic soldier will be misassigned at possible risk to himself and others.

The data presented concerning the known military performance of individuals with epilepsy who complete their military service demonstrate that, as was true with the other medical conditions studied, their acceptance results in increased utilization of hospital space, increased duty days lost for medical reasons, and increased sick-call or outpatient visits. Similarly, although a large percentage of those with epilepsy are able to complete their military service, these soldiers do not receive as many promotions to higher grades as do those without epilepsy who complete their military service. Although approximately 73 percent of the "successful" sample stated that they had epilepsy prior to entry into the military service, it is entirely possible that a large number of this group may subsequently be found eligible to receive compensation from the Veterans Administration because of the liberal interpretation authorized by law concerning "service aggravation."

In view of the many problems involved in the utilization and medical care of epileptics in the service, many military physicians state that it might be in the public interest, particularly during periods when manpower resources are plentiful, to disqualify all inductees who, at the time of their preinduction examinations, can furnish documentary evidence of epilepsy, or who are inducted and have their first convulsive seizure during basic or advanced training. An argument against this viewpoint is the fact that the majority of men accepted with controlled epilepsy actually complete their military category with what is considered adequate performance.

DUODENAL ULCER

Existing entry standards for enlistment and induction [18] specify that "ulcer of the stomach or duodenum" is disqualifying for induction and enlistment "if diagnosis is confirmed by the usual laboratory procedures." In addition, "an authentic *history* of gastric and duodenal ulcer" is disqualifying for enlistment or induction. Although these standards are designed to keep persons with peptic ulcers from entering the service, the existing retention standards are somewhat more liberal and permit a soldier to be retained in the service even though he may have the ulcer diathesis. Retention standards [17] provide that ulcer diathesis with scarring will usually not be considered a sufficient reason for finding the soldier unfit when the ulcer heals and there is no niche or ulcer crater observable on roentgenogram. When symptoms persist to at least a moderate degree following adequate medical treatment or when there is a history of frequent recurrence, retention standards specify that it is necessary to decide each case on an individual basis. Generally, these men, unless well motivated, are considered unfit for further military service. If the ulcer existed prior to the man's entry upon active duty, it is usually not considered by the Army Medical Service to be in "line of duty" or "service aggravated," unless there has been obstruction, perforation, or recurrent bleeding or unless, after prolonged hospitalization on the conventional ulcer regimen, the symptoms and roentgenographic evidence of the active ulcer persist.

A comparison of the dispositions by length of service of Regular Army and AUS enlisted men sick in hospital or quarters with duodenal ulcer in 1955 (table 23) indicates that the longer an enlisted man has been in the service, the greater the likelihood of his returning to duty upon release from the Army medical treatment facility. There was no significant difference between the proportions of Regular Army and AUS enlisted men returning to duty after serving 6 to 12 months or more. AUS enlisted men with duodenal ulcer, however, were more likely than Regular Army enlisted men to be separated during the first 6 months of service. This difference is believed to be associated with the observation previously noted [5] that the disposition of soldiers with duodenal ulcer is frequently influenced by the attitudes and opinions of both the patient and the medical officer treating his case. The manifestations of the disease as recorded in the "unsuccessful" group seemed no different from the recorded manifestations and symptomatology of the "successful" group.

No characteristic "ulcer" personality behavior pattern or psychosomatic manifestation was noted among the 266 successful inductees

Table 23. ***Disposition and length of service among Regular Army and AUS enlisted men sick in hospital or quarters with duodenal ulcer in 1955. Percentage distribution***

Disposition	*Length of service at time of admission*												
	Less than 3 months		*3 to 6 months*		*6 to 12 months*		*1 to 2 years*		*2 to 3 years*		*3 years or more*		*Total*
	RA	*AUS*	*RA*	*AUS*	*RA*	*AUS*	*RA*	*AUS*	*RA*	*AUS**	*RA*	*	*RA & AUS*
Duty**	35	18	60	45	86	81	89	88	88	83	92	–	86
Disability separation	38	52	16	36	6	10	6	7	9	11	5	–	9
Other	27	30	24	19	8	9	5	5	3	6	3	–	5
Total (%)	100	100	100	100	100	100	100	100	100	100	100	–	100
Number*** in hospital or quarters**	34	97	37	89	79	214	209	492	249	46	1,975	–	3,521

*AUS soldiers normally serve only 24 months.

**Weighted to equalize 50% sample of "duty" dispositions with 100% sample of "disability "and "other" dispositions.

***Since multiple admissions or diagnoses for 1 soldier are counted as separate admissions, number of admissions is greater than number of soldiers involved.

with duodenal ulcer. However, for 66 (25%) of these inductees, specific mention was made of associated psychosomatic manifestations or behavior pattern types. Most of these 66 soldiers were seen in psychiatric consultation. For 25 soldiers, the associated symptomatology was classified primarily as an anxiety manifestation. In addition, 19 were classified as passive-dependent, 6 were classified as passive-aggressive, and 16 were classified as having associated miscellaneous character and behavior patterns.

In this study, individual military physicians held a wide range of opinions concerning the necessity for assignment limitations and dietary restrictions upon return to duty status. With regard to assignment limitations, Sullivan and Hamilton [5] state ". . . past experience has not demonstrated this to be an effective method of preventing recurrence. These restrictions are not only unnecessary but undesirable." Data in this study indicate that the "successful" group of soldiers did serve in a wide range of military jobs, including most of those jobs classified as field or combat type military occupational specialties, a finding that tends to substantiate the foregoing observation.[5] It seems, therefore, that men with duodenal ulcer who have a good understanding of the general nature of ulcer disease and show some insight into their individual problems can, if necessary, be

utilized in most military situations without assignment limitations. It is impracticable in most military units to provide the conventional ulcer diet, but ulcer patients are able to exercise a reasonable degree of dietary selectivity in most military units. It is probable that better dietary selectivity would be available for units located in base areas than for those in combat situations.

In an excellent series of papers on the incidence and scope of the ulcer problem in the U.S. Army and on the military effectiveness of a large group of officers and enlisted personnel whom they treated, Palmer, Sullivan and Hamilton [5-8] have suggested a plan of treatment for ulcer patients in the military service. They state that soldiers with duodenal ulcer who are returned to duty may be expected to be noneffective for a *significant* but not *prohibitive* portion of their subsequent period of service.

The data reported here show that soldiers who were admitted to Army medical treatment facilities and were returned to duty had many more duty days lost for medical reasons, more sick-call visits, and fewer promotions to the higher enlisted grades than did a baseline sample of inductees without duodenal ulcer who also completed their military service. There were no significant differences between the 2 groups insofar as decorations received, courts-martial sentences, or days lost for disciplinary reasons.

KNEE JOINT INJURIES

Patients studied under this category were inductees who, in 1955, were sick in hospital or quarters with a diagnosis of internal derangement of knee or injury to cartilage of knee joint, hereafter referred to as "knee joint injuries."

Existing entry standards [18] provide that a person is acceptable for induction and enlistment who

> . . . gives a history of a satisfactory surgical connection of dislocated semilunar cartilage or loose body of the knee, provided six months have elapsed since operation without recurrence; the knee ligaments are stable in lateral and anteroposterior directions in comparison with the normal knee; the x-ray is negative for significant pathology; there is no weakness of the thigh musculature in comparison with the normal side; there is full active motion in flexion and extension; and there are no symptoms of internal derangement.

Regulations [18] state that subjects are nonacceptable for inducted or enlisted services if there is:

> . . . authentic history and/or physical findings of an unstable or internally deranged joint causing disabling pain or seriously limiting function. History of surgical connection of dislocated semilunar cartilage or loose body of the knee, if at the end of one year's postoperative time, the knee ligaments are not stable

in lateral and anteroposterior directions in comparison with normal knee; the x-ray shows pathology; there is no weakness or atrophy of the thigh musculature in comparison with the normal side; there is not full active motion in flexion and extension; or there are other symptoms of internal derangement.

Retention standards are not as specific as are the entry standards quoted for enlisted personnel. Derangement of the knee, or injury to the cartilage of the knee joint per se, is not mentioned. Retention standards [17] do state that "an unstable major joint may render an individual unfit when present in more than a mild degree and if symptomatic."

On a number of occasions in the past, the rejection at the preinduction medical examination of a selective service registrant who is a nationally known football or baseball player, because of a knee joint injury, has become the topic of much public interest. Noteworthy are the comments made in the orthopedic history of World War II, Mediterranean Theater of Operations,[19] concerning knee injuries in the soldier and the football player:

> The comparison between a football player with a knee injury and a soldier with the same type of injury, although often made, was never sound. Because athletes can return to violent activity on the football field within six to eight weeks after meniscectomy, it did not follow that soldiers could return to combat duty within a similar period of time. The circumstances are widely different. The injured athlete, outside of the game, is in the hands of a trainer and has access to heat lamps, massage, and other forms of therapy. When he goes on the field, his knee is well strapped. He remains in the game for only brief periods at first and may be removed on the first indication of trouble. Even at its roughest, a football game is divided into alternate periods of action and rest, and at the most only an hour is spent in actual play.
>
> The lot of an infantryman is very different. He must carry heavy packs and equipment many miles over rough ground or mountainous terrain, often in darkness, often in rain, snow, or mud. He cannot, like the football player, leave the game. He must continue until his mission is accomplished, even if his knee swells and is painful. When he has an opportunity to rest, it is likely to be a wet foxhole, often in cold and freezing weather. The commanding officer of a combat unit cannot always, like a football coach, consider his men first and the outcome of combat next. He must utilize every man at his disposal. A man unable to keep up with his comrades is a liability.
>
> The chief fallacy of the comparison concerns morale. The football player, anxious to retain his place on the team, cooperates in every effort at rehabilitation. The infantryman has only his sense of duty to urge him back to combat. Every instinct of self-preservation makes him call attention to any symptom from his knee. It requires a man of strong character to return to combat and to stay in it in spite of a knee which swells and becomes painful when it is overtaxed. This is why stress was put upon a favorable mental attitude as an absolute prerequisite to surgery of the knee joint in any theater of operations.

It was noted in this study that soldiers who have a derangement of the knee are frequently readmitted to a hospital or quarters status in

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the same year for the same condition. Inspection of the OTSG admission cards on 570 inductees with derangement of the knee who received inpatient care from Army medical treatment facilities in 1955 and subsequently returned to duty, reveals that 65 (11.3%) had 1 readmission with the same diagnosis in the same year, 10 (1.8%) had 2 readmissions, and 1 inductee had 4 readmissions. In other words, about 1 out of 8 was admitted to hospital or quarters status with derangement of the knee 2 or more times in the same year.

It is interesting to note the type of trauma recorded as preceding the knee joint injury. Among the "successful" group 110 alleged that their knee trouble was the result of athletic injuries: 71 from football injuries, 19 from basketball injuries, 5 from baseball injuries, and 15 from miscellaneous forms of athletic injuries in soccer, wrestling, judo, boxing, softball, or volleyball; 106 persons stated that their knee trouble was associated with a fall, jump, or twisting injury of the knee, 37 of them alleging that their disability was incurred during basic training activities; 2 stated that their knee injury was incurred in an automobile accident; and 2 others stated that their injury was associated with a motorcycle accident. In 55 instances the type of precipitating trauma was unspecified. The same types of precipitating trauma were noted with the unsuccessful group.

Most soldiers who incurred an internal derangement of the knee and who were subsequently returned to duty status were recommended for permanent assignment limitations, such as the following:

Permanent limitation, avoid prolonged working, lifting, calisthenics.

Permanent limitation, avoid running, jumping, prolonged walking.

Permanent limitation, avoid deep knee bends, squat jumps, prolonged double-timing or running.

Permanent limitation, avoid group athletics involving running and jumping, squat jump and deep knee bends.

Permanent limitation, no heavy work or physical training. No airborne training.

Among the "unsuccessful' group 122 individuals (90%) were separated for a disability that existed prior to service and was found to be *not* service aggravated in any instance. Eleven individuals were separated for disability *with severance pay*. One individual was placed on the temporary disability retired list with a 30 percent disability rating because of marked knee instability and was subsequently permanently retired with the same rating after the first periodic medical examination, when it was determined that the residual disability had stabilized. Two additional inductees were directly retired with 30 percent permanent disability or marked instability of the knee.

It was noted that there is a relationship between disposition and

length of service among both Regular Army and AUS enlisted men who were sick in hospital or quarters status with knee joint injuries in 1955 (table 24).

Table 24. ***Disposition and length of service among Regular Army and AUS enlisted men sick in hospital or quarters with knee joint injury in 1955. Percentage distribution***

Disposition	*Length of service at time of admission*												
	Less than 3 months		*3 to 6 months*		*6 to 12 months*		*1 to 2 years*		*2 to 3 years*		*3 years or more*		*Total*
	RA	*AUS*	*RA*	*AUS*	*RA*	*AUS*	*RA*	*AUS*	*RA*	*AUS**	*RA*	*	*RA & AUS*
Duty**	60	44	76	71	88	87	96	92	91	90	93	–	88
Disability separation	32	48	18	21	9	8	3	2	3	–	4	–	7
Other	8	8	6	8	3	5	1	6	6	10	3	–	5
Total (%)	100	100	100	100	100	100	100	100	100	100	100	–	100
Number*** sick in hospital or quarters**	53	131	50	132	173	393	305	875	325	31	812	–	3,280

*AUS soldiers normally serve only 24 months.

**Weighted to equalize 50% sample of "duty" dispositions with 100% sample of "disability" and "other" dispositions.

***Since multiple admissions or diagnoses for 1 soldier are counted as separate admissions, number of admissions is greater than number of soldiers involved.

The longer an enlisted man has been in the service, the greater is the likelihood of his returning to duty upon release from an Army medical treatment facility. There was no significant difference between the proportion of Regular Army and AUS enlisted men returned to duty after 3 months of service. AUS enlisted men with knee joint injuries were slightly more likely than Regular Army enlisted men to be separated during the first 3 months of service while undergoing basic and advanced training. It is interesting that 56 inductees (46%) of the 122 persons who were separated for disability that existed prior to entry had no record of duty time lost for medical reasons. These soldiers were not admitted to quarters status or hospital but were "carded for record only" and separated. The recorded evidence of previous disease of the knee in these instances was no more severe than that recorded among the "successful" group of soldiers with derangement of the knee. It is postulated that the early separation of these men was influenced by their poor motivation or by the attitude of the attending medical officer rather than by the severity of the disease process.

The data reported in this study show that soldiers who were admitted to Army medical treatment facilities with knee joint injuries and returned to duty had many more duty days lost for medical reasons, more sick-call visits, and fewer promotions to higher grades than did the baseline sample of inductees. There were no significant differences between the groups insofar as decorations received, courts-martial, or days lost for disciplinary reasons were concerned. Nevertheless, most of those who were accepted with a history of knee injuries in civilian life or who developed knee injuries in the military service were successfully utilized in a wide range of military jobs. Modification of selected portions of the basic training program or reassignment to different military jobs is indicated in selected instances for men with knee disability if the military job or training requires vigorous running or jumping or predisposes to falls.

(Part IV of this article will appear in the September issue and all references will be included there.)

WHEN NOT TO TRANSFUSE

It is our firm conviction that far too many patients are being given single pint transfusions. These are justified in hemorrhage when the rate and duration cannot be anticipated, as, for example, in certain injuries, gastrointestinal bleeding, and operations such as radical mastectomy. Unfortunately, most are given for such things as minimal to moderate blood loss during surgery of lesser magnitude, transient hypotension due to syncope and various anesthetic agents, false blood pressure readings due to loose tourniquet cuff, and postoperative hemoglobin determinations of 8, 9, or 10 grams. These situations are best met with simpler measures, such as Trendelenburg posture, peripheral vasoconstrictors, and the use of ferrous sulfate. Each year millions of blood donors lose a pint of blood in from 6 to 10 minutes. Is this an indication for transfusion? Many have reactions accompanied by pallor, sweating, cold extremities, and transient hypotension without requiring transfusion.—PAUL I. HOXWORTH: Physicians' Responsibility in Blood Transfusion. *Surgery, Gynecology & Obstetrics*, February 1960.

Did you enter our Poll of Readers?
See the June Issue

Case for Diagnosis

ERICH A. THEISS, M.D.
FATHOLLAH K. MOSTOFI, M.D.

A 32-year-old white man of Turkish origin, who had spent his childhood in the Mediterranean area and had served 2 years of imprisonment in the Balkan countries, recently suffered flank pain. A nephrectomy was performed, from which the patient recovered uneventfully.

Diagnosis?

Please turn the page

From Armed Forces Institute of Pathology. This month's Case for Diagnosis is AFIP Accession No. 803601, contributed by Dr. John J. Swihart, Detroit, Michigan.

Diagnosis and Discussion

Cut section of the surgically removed kidney revealed the central portion to be replaced by a cyst 5 cm in diameter, composed of masses of semitranslucent, thin-walled, gelatinous blebs. The low-power photomicrograph shows a bleb with its laminated acellular hyaline wall, containing scolices of viable *Echinococcus granulosus*. Higher magnification of a scolex reveals the characteristic hooklets.

Rare in North America, where 95 percent of the cases occur in immigrants, human echinococcus disease is rather common in pastoral countries, particularly in sheep-raising areas. Up to 1959 approximately 40 cases of echinococcus cyst of the kidney have been reported in the United States. Kidney involvement probably does not represent more than 2 percent of all hydatid cases.

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ROMAN MEDICINE

The ancient Romans did not care much about professional treatment of their sick. The temples of Saturn, the Roman god of fertility and also of healing, are said to have been the earliest sites of medical instruction and practice in Rome. This is, however, purely legendary. Later, until about the time of M. P. Cato (234–149 B.C.), the *pater familias* acted as family doctor. "Cato himself had written a little book of prescriptions for curing those who were sick in his family. . . ." (Plutarch, Cato Major, vol. I). Often specially trained slaves were employed as physicians. The first real physician who ever practiced scientific medicine in ancient Rome was Archagathos, born and educated in Greece. He came to Rome in 219 B.C. and was provided with a "taberna" or "medicina" that was modelled after the Greek "iatreion"; he was paid for out of public funds (Pliny, Nat. Hist., Bk. 29, ch. 6). There is a passage in the comedy "Menaechmi" of the Roman playwright Plautus (254–184 B.C.) that at least proves the existence of such tabernae in Rome at his time. Plautus makes the physician, who is called to treat a man apparently suffering from an acute psychotic condition, say this: ". . . do you know what's the best for you to do? Have him taken to my house . . . there at my own discretion I shall be able to treat the man. . . . I will make him drink hellebore some twenty days . . . go fetch some man to take him off to my house. . . . I shall go home that the things may be got ready which are necessary to be prepared. Bid your servants carry him to my house. . . ."—LUDWIG L. FRANK: Communal Medical Care; A Study of its Origins. *The American Journal of Gastroenterology*, February 1960.

Case Reports

Recurrent Ventricular Septal Defect With Acquired Aortic Insufficiency

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OPEN SURGICAL REPAIR of ventricular septal defect has become a relatively common procedure in a number of medical centers. As yet, there have been few reports in the literature concerning the repair of recurrent defects.[1-3] The following case illustrates not only a recurrent ventricular septal defect, but also an aortic insufficiency that was first detected following the initial repair.

CASE REPORT

This 13-year-old boy was first noted to have a cardiac murmur at 3 months of age. Throughout childhood he was active, although he remained underweight and had frequent respiratory infections. He had no cyanosis or clubbing of the fingers or toes. Cardiac catheterization at 7 years of age, and again at 10 years of age, demonstrated a left to right shunt at the ventricular level. At 10 years of age, his pulmonary artery pressure was 85/45 mm Hg, with a brachial arterial pressure of 130/70 mm Hg and oxygen saturation of 98 percent.

In September 1956, when he was 10 years old, the patient underwent open cardiac surgery at another hospital. Elective cardiac arrest with potassium citrate solution was utilized during the repair. The high ventricular septal defect, located in the membranous portion of the septum, was repaired "with an interrupted silk suture at the posterior end and with a 2- by 1-cm Ivalon patch at the anterior end."

The boy continued to receive digitalis, although his early postoperative course appeared to be uncomplicated. Following his convalescence he was active and had no complaints. Follow-up examinations, however, revealed further cardiac enlargement and persistence of the systolic murmur in the third and fourth intercostal spaces along the left sternal border. In addition, a new finding was a diastolic murmur at the left sternal area. Blood pressure was 120/30 mm Hg in the left arm. Data obtained by cardiac catheterization, in April 1958, showed little change from those of the 2 preoperative studies. A diagnosis of recurrent ventricular septal defect complicated by aortic insufficiency was made. Follow-

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ing catheterization the patient had a febrile illness, diagnosed as subacute bacterial endocarditis although no organism could be cultured, that subsided after prolonged antibiotic therapy.

In February 1959, the patient was admitted to this hospital. Clinical, roentgenographic, and electrocardiographic evaluation substantiated the diagnosis of recurrent ventricular septal defect with aortic insufficiency. The patient's cardiomegaly, which progressed in spite of continued full digitalization and restricted activity, indicated a grave prognosis. After consideration of the risks involved, a corrective open cardiac operation was undertaken on 25 March 1959.

The mediastinum was exposed through a midline sternum-splitting incision. The parietal pericardium was separated from the heart and great vessels by tedious sharp dissection. Venous cannulations were carried out through the wall of the right atrium, and arterial cannulation through the left femoral artery. The left atrium was vented by a catheter inserted through the right superior pulmonary vein. Circulation was maintained by a Sigmamotor pump and a bubble oxygenator. Through a right ventriculotomy the defect was visualized, but excessive regurgitation of blood required the cross clamping of the ascending aorta before the lesion could be completely evaluated. The defect appeared to have been adequately closed at the first operation, since the Ivalon patch was still securely fastened in place. However, 4 perforations, 0.2 to 0.3 cm in diameter, had developed in the center of the Ivalon patch and accounted for the recurrence of the left to right shunt. The central portion of the patch was excised, and the aortic valve examined. No abnormalities of the valve could be visualized through the defect. Attached to the left ventricular side of the patch was a loop of silk suture. The defect was easily closed with 3 interrupted silk sutures, which were tied after the left ventricle had been allowed to fill with blood. After closure of the defect, the aortic clamp was released, and the right ventriculotomy was closed. Upon release of the clamp across the aorta, the left ventricle became distended, and the heart began to fibrillate. All attempts to reinstitute an adequate cardiac action were unsuccessful. Finally pulmonary congestion and edema developed, the patient's condition deteriorated rapidly, and he died on the operating table.

Postmortem examination revealed an intact recent repair of the ventricular septal defect. At the center of the right cusp of the aortic valve there was a 0.3- by 0.5-cm fenestration, the edges of which were rolled and thickened but free of vegetations (fig. 1). Viewed from the left ventricular aspect, the fenestration was seen to be adjacent to the anterior end of the repaired ventricular septal defect (fig. 2). The heart also showed generalized hypertrophy and left ventricular dilatation. Severe pulmonary congestion and edema were the only other pertinent anatomic findings.

COMMENT

In this case the mechanism for the recurrence of the ventricular septal defect was the development of perforations in an Ivalon patch. A similar experience in 2 cases has been reported by Cooley.[2] The fact that perforations occurred is somewhat surprising in view of reports of spontaneous closure of holes intentionally placed in Ivalon used to repair atrial[4] and ventricular[5,6] septal defects. In the present case, it is possible that the jet of regurgitant blood from the aorta

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Figure 1. Aortic valve, viewed from the opened ascending aorta, showing fenestration in right cusp.

Figure 2. Opened aortic valve and ventricular septum viewed through the opened left ventricle. Fenestration in right cusp of aortic valve is adjacent to anterior extremity of recently repaired ventricular septal defect.

was an important factor in the development and maintenance of perforations in the sponge.

Postoperative aortic insufficiency is not necessarily the result of surgical trauma; an acute infectious process may give the same anatomic picture. One should, however, bear in mind the proximity of the aortic valve cusps to the membranous portion of the ventricular septum and the vulnerability of this valve to injury during surgery for ventricular septal defect. Kirklin and McGoon [7] have emphasized that during repair of defects high in the membranous portion of the ventricular septum, with little or no septal tissue beneath the aortic ring, care in placement of sutures is required in order not to catch an aortic valve cusp in the stitches.

This case also demonstrates the difficulty of resuscitating an arrested heart in the presence of aortic insufficiency. When the clamp across the aorta was released, the left ventricle was rapidly distended by regurgitant blood and intractable ventricular fibrillation resulted. Lillehei and associates [8] have reported similar experience in 2 cases. Considering this problem in the light of such experiences, we believe that success in operating upon the arrested heart in the presence of aortic insufficiency requires either repair of the aortic valvular defect or resuscitation of the heart by means of forward perfusion of the coronary arteries before the clamp across the ascending aorta is released. The importance of aortic insufficiency in this case cannot be overemphasized. Although clinically rather insignificant, it proved to be a major factor in the fatal outcome. It is recommended that an insufficient aortic valve be repaired before a septal defect.

SUMMARY

In the case reported, ventricular septal defect recurred when perforations developed in the Ivalon patch used for repair, and at this time aortic insufficiency was first discovered. Open cardiac repair of the recurrent defect was readily accomplished, but regurgitation of blood through the fenestrated aortic valve prevented restoration of normal cardiac rhythm. It is suggested that when aortic insufficiency complicates a septal defect, the aortic defect be repaired before septal repair is attempted.

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Aminoaciduria, Glycosuria, and Hypophosphatemic Rickets (de Toni-Fanconi Syndrome)

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INTRODUCTION OF NEW BIOCHEMICAL TECHNICS and improvement of others have increased our knowledge of renal physiology, and today we are better able to speak in terms of renal tubular diseases. One of these renal tubular disorders is that complex of hypophosphatemia with secondary bony changes, renal glycosuria, and generalized aminoaciduria—the de Toni-Fanconi syndrome. It is probably inherited as a simple mendelian recessive and it carries a poor prognosis, death usually occurring before puberty.[1–4]

The associated findings of dwarfism with rachitic manifestations, renal glycosuria, and hypophosphatemia were first emphasized by de Toni [5] in 1933, when he reported the case of a 5-year-old white girl with growth retardation, hypophosphatemia, and rachitic changes relatively unaltered by the administration of vitamin D. She exhibited persistent glycosuria but remained normoglycemic. Although

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there was evidence of some renal abnormality, renal glycosuria and hypophosphatemia distinguished her condition from severe chronic renal disease, characterized by hyperphosphatemia.

During the next few years, several additional cases of similar nature were reported, including one of particular interest because of the apparent clinical recovery of the patient, who, though he remained small and had radiologic evidence of earlier rickets, lived to adulthood.[6] In 1936, following de Toni's article, Fanconi [1] represented a patient whom he had included in an earlier study [7] of nondiabetic glycosurias, and labeled the syndrome "nephrotic glycosuric dwarfism in early infancy associated with hypophosphatemic rickets." The significance of his case, then, is not so much one of chronology or terminology, but rather that it marked the beginning of Fanconi's vigorous attack on this problem. He confirmed Debré and associates' [8] earlier findings of increased excretion of organic acids and suggested that there might be an increase in amino acid excretion and that the basic problem might be in the renal tubule. De Toni [5] had first postulated a decreased functional activity of the renal tubules in 1933.

McCune, Mason and Clarke [9] demonstrated in 1943 that a very large excretion of amino acids accounted for the increase in organic acids, but it was not until 1947 that Dent,[10] using a new technic of paper chromatography, found that from 10 to 20 amino acids were excreted in excess in the urine of 3 patients with the associated findings of glycosuria and hypophosphatemia with secondary bony changes.

In several reports of postmortem examinations on patients with this syndrome, the deposition of cystine crystals in the reticuloendothelial system has been noted. Subsequent study demonstrated that the crystals were found primarily in the reticuloendothelial system, but also in the kidney, subcutaneous tissue, and corneas.[11,12] The presence of cystine crystals in human tissue, however, had been demonstrated as early as 1903 by Abderhalden; [13] and Lignac [14,15] later reported finding cystine crystals in autopsy tissue of children who were physically retarded and had rickets. It was then believed that the deposition of cystine crystals in the reticuloendothelial system—cystinosis—was a probable cause of the de Toni-Fanconi syndrome, and that the 2 entities were possibly the same. However, although the de Toni-Fanconi syndrome and cystinosis are frequently associated, careful postmortem examinations of several typical cases of the de Toni-Fanconi syndrome have not revealed cystinosis.[16] Cystinosis is distinguished from cystinuria, an inherited abnormality in which unusually great quantities of cystine,

lysine, arginine, and ornithine are excreted in the urine and in which, despite the large amino acid losses, the patients suffer no severe nutritional disturbance.[17,18]

Since the earliest studies relating to this disease process were published, there has been controversy regarding its etiology and pathogenesis. De Toni [5] postulated a decreased functional activity of the renal tubules and Fanconi [1] believed that the clinical findings were secondary to an excessive urinary loss of base, phosphorus, and glucose, possibly the result of reabsorption interference in the proximal renal tubule. Following the reports of cystinosis associated with the de Toni-Fanconi syndrome, many authors believed there was a primary defect in amino acid metabolism in the tissues and that the aminoaciduria was secondary to an increased blood level of amino acids. Dent [10] and other investigators,[18,19] however, demonstrated a normal concentration of plasma amino acids and postulated that the excessive urinary loss of amino acids, glucose, and phosphorus was of renal origin. In 1952, increased plasma levels of amino acids were again reported by Bickel and associates,[4] who postulated that the aminoaciduria was secondary to an overflow mechanism. They noted, in addition, a decreased intestinal absorption of calcium and phosphorus and suggested that poor absorption, instead of increased urinary excretion of calcium and phosphorus, was the cause of the rickets. Their interpretation was based chiefly on the assumption that protein anabolism is altered so that inadequate utilization of amino acids causes them to accumulate in the tissues. Cystine would be visibly present because of its relative insolubility, and other amino acids would not be apparent because they would not precipitate. These authors suggested, further, that glycosuria was the result of glyconeogenesis from amino acids by the kidney rather than an abnormality of tubular reabsorption of glucose.

Although this interpretation of the pathogenesis of the disease gained wide acceptance, it is no longer tenable, for the causative factor has been shown to be an abnormality of proximal tubular reabsorption.[16,20-22] Phosphorus clearance is high, secondary to the reabsorptive abnormality, and recent investigations have failed to demonstrate increased plasma concentration of amino acids, making the renal origin of the aminoaciduria more credible. An abnormality of protein metabolism—formerly postulated on the basis of increased concentration of amino acids—is further unlikely in the presence of normal plasma levels of these acids. Inadequate tubular reabsorption of glucose has been shown; and the concomitant rise in urine glucose as plasma glucose is increased, as shown by Worthen and Good,[16] further negates the theory of renal glyconeogenesis. In addition to

the excessive urinary loss of amino acids, glucose, and phosphorus, water reabsorption may be hampered, with resultant polyuria, and the urinary excretion of potassium may be excessive. The potassium loss probably also represents decreased proximal tubular reabsorption, although altered distal tubular potassium secretion, as a result of inhibited hydrogen-ion exchange, may be a factor.

It seems apparent, then, that the basic problem is one of decreased proximal tubular reabsorption; further, that this may be secondary to an anatomic abnormality of the tubule itself, or to an altered enzyme system that regulates reabsorptive processes. Clay, Darmady and Hawkins [23] demonstrated by microdissection a narrowing and shortening of the proximal tubule in 2 patients in whom a diagnosis of de Toni-Fanconi syndrome with cystinosis had been made. Histologic examinations of renal tissue of similar patients, however, have not revealed consistent findings, although progressive destruction of tubular epithelium is seen when the disease is of long duration. The cause of these changes is not as yet clarified, although the toxic effect of amino acids, notably cystine, has been strongly considered.

Cystine, normally being reduced to cysteine before entering the metabolic chain of sulfur-containing amino acids, may well be accumulated by a block in this metabolic chain. Harrison and Harrison [24] produced a generalized aminoaciduria, glycosuria, and phosphaturia in rats by the intraperitoneal injection of maleic acid, inducing a change in the enzyme systems that control tubular reabsorption. The generalized aminoaciduria of Wilson's disease may be secondary to renal tubular injury from accumulation of copper in the tubular cells.[25, 26] Aminoaciduria, glycosuria, and phosphaturia have also been reported in a child with lead poisoning.[27]

The usual course of the de Toni-Franconi syndrome is progressively downhill. Therapeutic attempts, for the most part, have been unsatisfactory, and most patients die before puberty. Improvement of phosphorus metabolism, correction of the rickets, and in some cases a decreased urinary excretion of amino acids and glucose have been reported following treatment with large doses of vitamin D (up to 50,000 units daily).[4, 20, 22, 28] Worthen and Good [16] have not confirmed any specific improvement, noting rather that the response to therapy is actually secondary to decreased glomerulotubular balance and glomerular filtration. Temporary clinical improvement, however, has been achieved with moderately high doses of vitamin D and Shohl's citrate solution.[12]

Because of the relative uncommonness of this pathophysiologic process and its many interesting facets, the following case report is presented.

CASE REPORT

Upon arrival in San Francisco, on 4 March 1958, after a 9-day voyage from the Orient, a 6-year-old white girl was transferred for immediate hospitalization because of persistent vomiting and marked dehydration. She had been in apparent good health before her journey, but shortly after sailing she began to vomit and soon became listless and dehydrated. She had received fluids parenterally, and Dramamine, atropine, penicillin, and streptomycin sulfate had been administered without apparent benefit.

The product of a full-term uneventful gestation period, the patient weighed 7 lb 8 oz at birth. Her course during her first several months was not remarkable, except for frequent episodes of vomiting, which necessitated several formula changes. She sat up at 5 months and walked at 24 months. When 1 year of age she was hospitalized for several weeks because of persistent vomiting, which gradually came under control while she was receiving fluids parenterally. Her parents related that she was then in good health, though she seemed small for her age. When 2 years old, she was again hospitalized for several weeks because of vomiting and dehydration. At the age of 3 years she was hospitalized a third time for vomiting and dehydration, and during that hospitalization, persistent albuminuria and glycosuria were noted. An intravenous pyelogram was said to demonstrate poorly functioning kidneys, and a diagnosis of chronic nephritis with secondary renal rickets was entertained. The patient was discharged to her parents' care with her condition described as unimproved, but shortly thereafter she began taking fluids adequately and appeared to be doing well.

According to the parents, the child's condition remained satisfactory until the onset of the present difficulty. It was noted, however, that she always drank great quantities of liquid and had a large urine output. She had received daily vitamin supplements throughout her lifetime.

The family history was not significant. The parents were not blood related. One male sibling, 2 years old, was in good health.

On her present hospital admission the patient appeared to be chronically ill, irritable, small for her stated age, and severely dehydrated. Tissue turgor was poor, her mucous membranes were very dry, and her eyes were sunken. She weighed 13.6 kg. and was 88.9 cm tall. The biparietal circumference was 50 cm. She exhibited marked frontal bossing, a Harrison's groove, and a rachitic rosary. Her hair was dry and quite sparse. The corneas appeared cloudy and lusterless. The liver and spleen were just palpable but not abnormally enlarged.

Posteroanterior and lateral roentgenograms of the chest were interpreted as within normal limits. Films of the wrists, however, revealed some bilateral widening and slight cupping of the distal ends of the ulna and radius, compatible with rickets.

Laboratory studies on admission revealed: Serum sodium 144 mEq/1, potassium 3 mEq/1, chloride 105 mEq/1, carbon dioxide 6.5 mEq/1. Serum calcium was 11 mg per 100 ml, inorganic phosphorus 6.6 mg per 100 ml, and blood urea nitrogen 61.1 mg per 100 ml. The urine had a specific gravity of 1.008, with 2 plus albumin and 4 plus sugar. The patient was markedly lethargic during the initial hydrating period but became slightly more alert as her hydration improved, and the blood urea nitrogen fell to 13.1 mg per 100 ml. After adequate hydration the inorganic phosphorus ranged from 1.1 mg to 3.6 mg per 100 ml, and a fasting blood sugar was 100 mg per 100 ml. The restoration to "normal" fluid balance was marked by several episodes of extreme hypokalemia. Throughout the entire interval the patient excreted great quantities of urine, 24-hour urine volumes ranging from

3,000 to 4,200 ml, and she maintained a persistent albuminuria (1 to 2 plus) and glycosuria (1 to 4 plus). Urine studies for amino acids revealed generalized aminoaciduria, with 148 mg of amino acid nitrogen per 24-hour urine volume. When the patient became stable, her eyes were examined with a slit lamp, revealing all corneal layers to be studded with cystine crystals.

Because the family was en route to their home in the Southwest, the patient was evacuated by air to that destination, and at the present time is there under pediatric follow-up.

SUMMARY

A case of a 6-year-old girl with rickets, aminoaciduria, and glycosuria is presented. Deposits of cystine crystals were observed in the cornea. The literature on the de Toni-Fanconi syndrome is reviewed and theories of its pathogenesis are discussed.

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Management of Traumatic Hyphema

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ONE OF THE MOST SERIOUS PROBLEMS in ophthalmology is the management of traumatic hyphema. Even a small amount of blood in the anterior chamber of the eye following a contusion of the globe is indicative of a severe injury and may be followed by devastating changes. Many of the ensuing complications may be avoided by

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early and effective treatment. The purpose of this article is to present a case of traumatic hyphema with delayed absorption of blood in the anterior chamber and to discuss briefly the management of this condition.

CASE REPORT

A 14-year-old white boy was struck in the right eye with a snowball on 14 March 1959. At that time he noted some pain in this eye but no decrease in visual acuity. On the following day, he continued to have moderate discomfort in his right eye, namely photophobia and lacrimation. On the morning of 16 March, the pain had become severe, the photophobia had markedly increased, and his vision had decreased to light perception. It was at this time that he presented himself at the eye clinic, approximately 52 hours after the initial injury.

On examination, the left eye was found to be perfectly normal in all respects, with a visual acuity of 20/20. Visual acuity in the right eye was reduced to light perception. Slight edema of the lids of the right eye was present, as well as marked injection of the conjunctiva and limbus. Photophobia and blepharospasm were moderate to severe. The entire anterior chamber, with the exception of the upper 3 mm, was filled with bright-red blood. No view of the fundus was possible at this time. Intraocular tension (Schiøtz) was 35 mm Hg in the right eye, 17 mm Hg in the left eye.

The patient was hospitalized and placed on complete bed rest, with his head elevated approximately 20° to 25°. Patches were applied to both eyes. Diamox (acetazolamide), 125 mg every 6 hours, was given to counteract secondary glaucoma. Vitamin C, 75 mg 3 times a day, and menadione, 2 mg twice a day, were given empirically. Phenobarbital, 15 mg, was prescribed 4 times a day for sedation. Neither miotics nor mydriatics were instilled into the eye.

Roentgenograms of the globe and orbit of the right eye were negative for the presence of any foreign body. Repeat determinations of bleeding time, coagulation time, prothrombin time, clot retraction time, and complete blood cell and platelet counts were all within normal limits.

By 23 March (tenth day) the intraocular pressure in his right eye had decreased to 15 mm Hg, and hyphema had markedly absorbed to a level of 2 mm. Diamox was gradually reduced. At this examination, the anterior chamber was deep. The pupil was 3 mm and exhibited a slight irregularity. Heterochromia was observed, the iris of the right eye having changed from blue to green.

On 30 March intraocular tension was normal and Diamox was discontinued. Hyphema of 2 mm still persisted. The pupil was now dilated with 1 percent Cyclogyl (cyclopentolate) hydrochloride in order to rupture any posterior synechias. No dislocation of the lens or cataract was noted. Neo-Hydeltrasol (prednisolone 21-phosphate-neomycin sulfate), 0.5 percent solution, was prescribed every 2 hours to counteract traumatic iridocyclitis. By 4 April visual acuity had improved to 20/50 in the right eye. Hyphema of 2 mm persisted, however.

On 9 April fever therapy was tried. Intravenous administration of 4 million organisms of typhoid H antigen followed by a 3½ million booster produced a temperature rise to 102° F. By the following day, the visual acuity of the right eye had improved to 20/20–1, and hyphema had almost entirely disappeared. A second dose of 10 million organisms of typhoid H antigen was given intravenously on 11 April, producing a fever of 101° F.

Examination of the right eye on 12 April (thirty-first day) revealed the visual

acuity to be 20/20. Intraocular pressure was normal. Cornea and aqueous were perfectly clear. Hyphema had completely absorbed. The iris, however, exhibited atrophic changes producing a slight corectopia. On funduscopic examination, the media was clear; the optic nerve head, macula, and periphery of the retina failed to show any pathologic changes. Gonioscopy revealed a wide open angle with heavy pigmentation of the trabecular meshwork. No peripheral anterior synechias were present. Visual fields were normal.

The patient was discharged the following day and has remained asymptomatic

DISCUSSION

The majority of hyphemas following contusion of the globe absorb rapidly. It is generally agreed, however, that secondary hemorrhage on the third to fifth day carries with it a poor prognosis, frequently resulting in secondary glaucoma and blood staining of the cornea.[1–6] In the case reported, it is believed that a secondary hemorrhage occurred on the third post-traumatic day.

Review of the literature reveals considerable diversity of opinion concerning the management of traumatic hyphema. Thygeson and Beard [6] recommend immediate hospitalization and absolute bed rest. In their series of cases, however, some of the poorest results were obtained in the most cooperative patients, whereas excellent results were obtained in many uncooperative patients. Children and apprehensive adults should receive adequate sedation to minimize general body activity.[2,6] Elevation of the head of the bed 20° to 25° allows settling of the blood inferiorly in the anterior chamber and theoretically should decrease the incidence of posterior synechias.

Although binocular patching of the eyes is preferred by most authors to help immobilize iris and ciliary body, Dickinson [2] points out that "in the very young, the fear engendered by binocular patching, in spite of heavy sedation, often led to more thrashing and general activity than when the eye was left unpatched." Sandbags placed on both sides of the head frequently help minimize activity and maintain the patient's head in a fixed position.

The administration of mydriatics as opposed to miotics in the presence of hyphema has given rise to much controversy.[6–11] Although mydriasis tends to immobilize the uveal tract and guards against the occurrence of traumatic iridocyclitis and posterior synechias, it decreases the iris surface available for the absorption of blood and may, in addition, obstruct the chamber angle, increasing the likelihood of secondary glaucoma. Miosis, on the other hand, increases the iris surface for the absorption of blood, opens the filtration angle, and partially immobilizes the edges of the wound; however, it also produces increased congestion of the uveal tract and theoretically might promote bleeding. Many ophthalmologists today

use neither mydriatics nor miotics routinely in the early treatment of hyphema.

Although some ophthalmologists believe that cold compresses tend to retard bleeding,[1,9,12] others question their efficacy.[3,6] Numerous investigators have found that the blood studies of patients with traumatic hyphema were consistently within normal limits and as a result have concluded that vitamin K, often given empirically, is ineffectual in this condition.[2,3] Rutin and vitamin C, however, are recommended to reduce the possibility of capillary fragility.[6]

Theoretically, the use of steroids, such as cortisone and corticotropin, will cause shortening of the clotting time; hence, they are generally contraindicated.[4] In the case of delayed absorption of blood in the anterior chamber, however, steroids may be given topically after the first week to decrease traumatic iridocyclitis.

In cases complicated by elevated intraocular tension caused by secondary hemorrhage that does not completely fill the anterior chamber, acetazolamide (Diamox) may be administered systemically.[2] Although necessary at times to control secondary glaucoma, Diamox may delay absorption of blood from the anterior chamber. When the entire anterior chamber is filled with blood in the presence of elevated tension, paracentesis should be performed immediately,[2,9,11] and may be repeated as often as necessary to control intraocular tension until the blood begins to absorb.[5] The introduction of an air bubble into the anterior chamber on the occasion of the first paracentesis will prevent the development of peripheral anterior synechias.[9]

Fever therapy for hyphema has received relatively little attention in the literature. Rosenthal [3] mentions it only to condemn it. To control uveitis and increase the absorption of blood, Allen [13] advocates small intravenous doses of foreign protein in the form of 10, 15, or 20 million organisms of typhoid H antigen daily. He has found that larger doses produce a shocklike reaction and may aggravate bleeding.

In the routine case of traumatic hyphema, where the absorption of blood is responding to conservative measures, I do not believe that fever therapy is indicated. However, when residual hyphema has persisted for several weeks, as in the case presented here, the administration of small intravenous doses of pyrogenic agents may produce dramatic absorption of all blood in the anterior chamber.[14]

SUMMARY AND CONCLUSIONS

Traumatic hyphema, particularly when followed by secondary hemorrhage on the third to fifth day, is a serious ocular problem. A case of traumatic hyphema with delayed absorption of blood in the anterior

chamber following contusion of the globe is reported and its management outlined. Early treatment to control secondary glaucoma and blood staining of the cornea is emphasized.

Therapeutic measures for traumatic hyphema include bed rest, sedation, ocular patching, miotics, mydriatics, cold compresses, vitamin K, rutin, vitamin C, steroids, acetazolamide (Diamox), paracentesis, and fever therapy. No general agreement regarding the management of this condition exists. In cases of persistent residual hyphema of several weeks' duration in which the intraocular tension is controlled, dramatic resolution may be produced by the use of fever therapy in the form of small intravenous doses of typhoid H antigen.

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Technical Notes

The Neutral Red Test

A Method of Determining Virulence of Mycobacteria

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A FREQUENT REQUEST received by the Central Laboratory of the Florida State Board of Health is the determination of virulence of acid-fast organisms cultured in other laboratories as well as its own. The current practice is to inoculate a suitable suspension of the culture growth into a guinea pig. A period of 5 to 8 weeks must elapse before lesions develop and autopsy can be performed. Because this procedure is expensive and time consuming, this laboratory became interested in the rapid in vitro method of determining virulence of mycobacteria, first described by Dubos and Middlebrook,[1] who recognized that virulent strains of *Mycobacterium tuberculosis* take up neutral red dye in an alkaline buffer solution while avirulent strains fail to do so. The test is simple to perform and the results are available in a few hours.

Other workers who studied this reaction have described excellent agreement between the neutral red reaction and guinea pig virulence. Richmond and Cummings [2] found that the neutral red reaction was constant for any given strain, and all strains that were virulent by animal inoculation were also neutral red positive. They encountered 1 strain from vegetable sources that was neutral red positive but avirulent for the guinea pig. Morse, Dial and Olitzky [3] found that all strains tested that were culturally consistent with *Myco. tuberculosis* were neutral red positive and produced characteristic lesions in animals. Chromogens and nonpathogenic acid-fast organisms tested were negative in the neutral red test and produced no lesions in the guinea pig. Of 191 strains of acid-fast bacilli from

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human sources tested by Hughes and co-workers,[4] 189 produced typical lesions in guinea pigs and gave a positive neutral red reaction; the 2 other strains, both negative to neutral red, 1 of which produced lesions in the test animal, were subsequently identified as species of *Nocardia*.

Since 1956 we have conducted a comparative study of the neutral red reaction and the guinea pig method for determining virulence of acid-fast bacilli. A large number of acid-fast strains tested were submitted from other laboratories in different parts of the state; others were cultured in our own laboratory. Limited animal housing facilities did not permit testing of all strains isolated in our laboratory.

METHODS

When a request was received, this laboratory initiated the 2 tests simultaneously if sufficient growth was available on the culture. If culture growth was scant, we made subcultures before starting either test. The neutral red technic as modified by Hughes and co-workers [4] was used in this study since it appeared to be more applicable for a routine diagnostic laboratory.

Guinea Pig Inoculation

A suspension of the culture growth was prepared in a sterile tube containing 2 ml of sterile saline solution. Representative colonies were transferred to the inner surface of the tube with a sterile wooden applicator, one end of which was shaped like a spade. The colonies were ground against the side of the tube and the resulting suspension was allowed to stand for a few minutes to allow the larger particles to settle out.

The suspension was diluted to a faint visible turbidity with sterile

Table 1. ***Comparisons between neutral red reaction and guinea pig virulence in 253 cultures of mycobacteria***

Neutral red reaction	*Guinea pig virulence*				*Totals*	
	Positive		*Negative*		*Number*	*Percent*
	Number	*Percent*	*Number*	*Percent*		
Positive	175	69	48	19	223	88
Negative	0	–	30	12	30	12
Totals	175	69	78	31	253	100

saline solution. The guinea pig was inoculated in the right groin with 0.2 ml of the diluted suspension. Two Loewenstein-Jensen slants were also inoculated to provide material for repeating the tests if necessary. After 5 weeks, the animals were skin tested with 0.1 ml of 5 percent old tuberculin. If the skin test was positive, autopsy was performed, and stained smears for acid-fast organisms were prepared from all infected tissue. If the skin test was negative, the animals were held 8 weeks before autopsy.

Neutral Red Test

The neutral red test [4] was carried out as follows:

1. Approximately 5 ml of 50 percent methyl alcohol was placed in a screw-cap tube.
2. Two or more of the acid-fast colonies were transferred to the tube.
3. The tube was incubated at 37°C for 1 hour.
4. The fluid was decanted.
5. Approximately 5 ml of 50 percent methyl alcohol was added.
6. The tube was incubated at 37°C for 1 hour.
7. The fluid was decanted.
8. Approximately 5 ml of alkaline buffer, composed of 1 percent sodium barbital in 5 percent sodium chloride solution, was added to the tube. The buffer should be fresh (not over 2 weeks old).
9. To this was added 0.02 ml of 0.05 percent aqueous solution of neutral red.
10. This was incubated for 1 hour at 37°C. The tubes were agitated thoroughly every 15 minutes.
11. The test was read at the end of the hour. Any pink or red staining of the colonies suspended in the amber solution was considered to be a positive test.

The neutral red test was read with the aid of a hand lens and a bright light. The H_{37} RV virulent strain of *Myco. tuberculosis* and the avirulent variant H_{37} RA were used as controls in the test. The intensity of the staining varied with different strains, in some the entire surface of the colonies being red or pink, whereas others were streaked in appearance. The presence of pink or red staining on any of the colonies, however, was considered a positive reaction.

RESULTS

Of the 253 cultures of acid-fast organisms examined, 175 strains culturally consistent with *Myco. tuberculosis* were neutral red positive and produced characteristic disease in guinea pigs. Thirty strains culturally characteristic of acid-fast saprophytes were neutral red negative and did not produce any lesions in the guinea pig (table 1). Forty-eight strains were found to be neutral red positive but did not produce lesions beyond the site of inoculation in guinea pigs.

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DISCUSSION

It is of significance that 48 (19 percent) of the cultures tested were neutral red positive but failed to produce progressive disease in the animals. Information was sought in an effort to learn why these conflicting results were obtained. It was found that 10 of the strains had been obtained from patients who were in tuberculosis hospitals and who were being treated with antituberculosis drugs. Apparently the organisms had become drug resistant and were attenuated for guinea pigs but were still capable of absorbing neutral red dye. Cohn and associates [5] have found isoniazid-resistant strains of *Myco. tuberculosis* that were attenuated in virulence for guinea pigs but were fully virulent for mice. It was also learned that 15 strains had been obtained from patients known to be discharging atypical acid-fast bacilli. The ability of some of the atypical strains to bind neutral red dye—yet not be infective for animals—has been shown in a previous study.[6] No information was available to suggest explanation for the remaining 23 cultures, which gave positive neutral red reactions and were negative in guinea pigs. The possibility of previous isoniazid therapy, however, could account for this loss of virulence for guinea pigs. Eighteen of these strains were culturally consistent with *Myco. tuberculosis* and 5 resembled the atypical strains.

Of the 175 strains positive by both tests, 73 were found to have been obtained from patients with no previous history of pulmonary disease or contact with antituberculosis drugs.

The findings in this study suggest that the neutral red test would be useful under certain conditions in a routine diagnostic laboratory as an adjunct procedure for determining virulence of *Myco. tuberculosis*. To rely on the neutral red reaction without taking into account the susceptibility of organisms to isoniazid would be misleading. Furthermore, the neutral red test does not distinguish between virulent strains of *Myco. tuberculosis* and neutral red-positive strains of atypical mycobacteria, many of the latter having little or no virulence for man.

SUMMARY

Two hundred and fifty-three acid-fast strains of mycobacteria were tested for virulence by inoculating guinea pigs and comparing the results with those obtained in the neutral red test. In 81 percent of the strains tested, test results showed agreement. In 19 percent of the strains tested the results were not in agreement. Some of the factors which may have influenced the results are discussed.

ACKNOWLEDGMENT: The authors acknowledge with thanks the technical assistance of Mrs. Kathleen Foster, Mrs. Emma Levy, and P. D. Allen.

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Self-Cleansing Colostomy Tube

ARTHUR D. MACK

THE ONLY EQUIPMENT available to aid patients in colostomy irrigation does not serve the purpose in a satisfactory manner. A recently devised unit, consisting of a plastic cap and disposable bag, is an improvement but still necessitates a cleanup following the colonic irrigation. As long as this cleanup process is necessary, the patient requires assistance, since a rest period necessarily follows the irrigation. The tube described here is the only unit so far devised by which the patient can handle the irrigation and flushing process unassisted.

DESCRIPTION

The tube of either plastic or glass (fig. 1) is approximately 8 inches long and 1¼ inches wide. It is simple and inexpensive to make. The connecting piece (A) is attached to the end of a rubber tube from a filled enema bag. The opening of the cleansing tube (B) is placed over the surface of the colostomy after the irrigation. This opening (B) can vary in diameter from 2½ to 3 inches, depending

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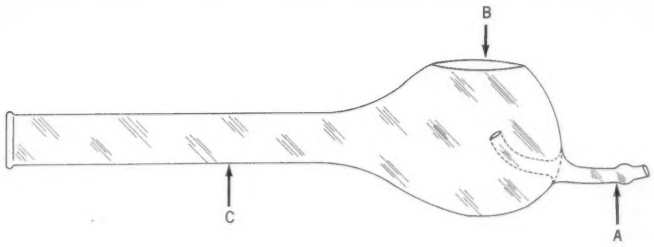

Figure 1. Diagram of colostomy tube.

upon the size of the opening into the colon. The neck of the tube (C) is directed into the receptacle or latrine on which the patient is seated. This procedure enables the patient to remain dry and prevents the escape of any fecal material. As the colostomy drains, the patient can open the release clip on the enema bag and flush the tube at any desired time. The tube may then be used again without further cleansing.

SUMMARY AND CONCLUSIONS

A colostomy cleansing tube that directs the flow of fluid after irrigation of a colostomy is described. It has the advantages of being self cleansing, comfortable and easy to use, and simple and inexpensive to make. As waste material is flushed directly into the receptacle, cleanup and disposal problems are eliminated. This tube has been used at Georgetown University Hospital, Washington Clinic, Doctors Hospital, and D.C. General Hospital with uniformly favorable comments from the medical staffs and patients.

Self-Retaining Retractor for Minor Surgery

FIRST LIEUTENANT CHARLES T. YARINGTON, JR., MSC, USAR

IN MINOR SURGICAL PROCEDURES, such as removal of a ganglion, sebaceous cyst, or foreign body, or where adequate exposure must be obtained and a relatively small incision is desired, the problem of a suitable retractor is encountered. Most instruments incorporate a

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rake-type retractor, which must be placed in the wound and is therefore not always acceptable. Many surgeons obtain adequate exposure by traction, using Allis clamps, hemostats, or tissue forceps fixed to the wound edge or to underlying tissue. This principle has been used to develop a self-retaining retractor for small incisions that require ample exposure and hemostasis.

The retractor (fig. 1) consists of 2 metal bars shaped as right angles, the shorter side of each ending in an open hook to engage Allis clamps. One of the bars is hollow to contain the other, permitting telescopic lengthening. A setscrew on the hollow bar holds the joined bars in place at the desired length. Once the instrument has been applied at the incision site, the retractor forms a rectangle, with 3 sides of fixed length and the fourth side composed of 2 Allis clamps and the open incision. The one variable dimension in the rectangle is the width of the incision, which will change only with adjustment of the setscrew. The 2 fixed right angles ensure stability of the apparatus.

The instrument meets the following criteria: (1) it is easily stored and sterilized; (2) it may be applied and removed without disturbing the surgical field; (3) undercutting of tissue, constant pressure on one part of the wound edge by a rake-type retractor, and introduction of bulky instruments into the incision are obviated; (4) clamps may be released and reapplied at will, without touching the retractor; and (5) constant tension is achieved and the wound edges are kept taut, affording a good degree of hemostasis.

Clinical trials of the retractor have been satisfactory and are continuing.

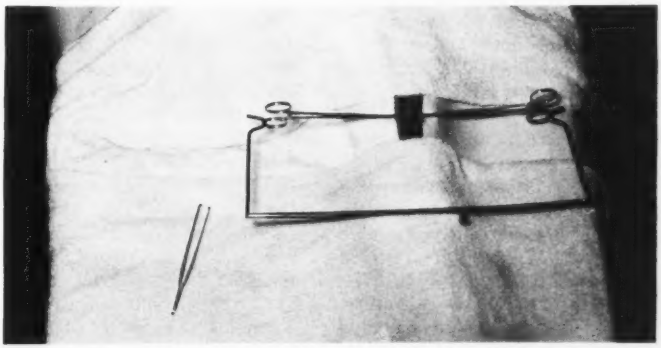


Figure 1. The retractor applied at an incision site. Method of attachment to Allis clamps is illustrated.

Military Medical News

Schwartz to Command Letterman; Tynes Goes to Tripler

Major General Jack W. Schwartz

Brigadier General A. L. Tynes

Major General Jack W. Schwartz, MC, USA, commanding general, Tripler Army Hospital, Hawaii, and Brigadier General Achilles L. Tynes, MC, USA, commander, Letterman General Hospital, Calif., will swap commands in September.

Assigned as Tripler's commanding general since 1958, General Schwartz is a veteran medical officer with more than 30 years' service. He received his medical degree from the University of Texas Medical Branch in 1928, completing his internship at Fitzsimons Army Hospital, Denver, Colo., after his entry into military service that year.

Appointed chief, Surgical Service, Bataan General Hospital #2 in the Philippines in 1941, he was captured when the Japanese invaded Bataan in 1942 and held prisoner of war until his release in 1945.

General Schwartz served as chief, Urology Service at Letterman after the war until 1953, when he was assigned as chief, Professional Services, and chief, Urology Service, Walter Reed Army Hospital, Washington, D.C. He was subsequently appointed commanding general of Madigan Army Hospital, Tacoma, Wash., where he remained until his assignment to Hawaii in 1958.

The general is a member of the American Medical Association, the American Urological Association, the Washington Urological Association, and the Mid-Atlantic Urological Society, and a fellow of the American, College of Surgeons. His new assignment as commander of Letterman General Hospital will be effective in September.

General Tynes graduated from the University of Virginia Medical School in 1930 and was commissioned in the Army Medical Corps that year. He served the first 8 years of his Army career in various posts as medical officer, general service, and in 1939 completed postgraduate studies in anesthesiology at the Mayo Clinic, Rochester, Minn.

Early in 1941, he was assigned to the Surgeon General's Office, Washington, D.C., where he not only assisted in the planning and construction of the entire hospital program for World War II, but also supervised planning for the whole fleet of 29 hospital ships, an accomplishment for which he was later to receive the Legion of Merit.

During the postwar expansion of medical facilities, the general was placed in charge of planning for the new Tripler Army Hospital in Hawaii and in 1945 assumed command of the old Tripler, simultaneously assisting in the supervision of the construction of the new hospital. Following this assignment he returned to Washington as chief, Medical Facilities and Planning Branch, and in 1949 was placed in charge of Medical Plans and Operations Division, during which time he supervised the planning of 11 hospitals on permanent Army posts. The last of the 11 to be completed is the hospital he commanded at Fort Dix, N.J., before assuming command of Letterman.

Parrish Named Consultant to Army Surgeon General

Major Matthew D. Parrish, MC, USA, has been named assistant chief psychiatry and neurology consultant in the Professional Division of the Army Surgeon General's Office, Washington, D.C.

A graduate of George Washington University Medical School in 1950, Major Parrish entered the U.S. Army Air Corps in 1941, serving as aerial navigator in the 404th Bomb Squadron, 11th Air Force, in Alaska and the Aleutian Islands until 1943. Subsequently he was assigned as chief of navigation at the Ground School for B–29 bombers at Clovis Army Base, N. Mex., until the end of World War II.

From 1945 to 1950 Major Parrish left the service to study medicine, re-entering in 1950 after completion of his internship at Letterman General Hospital, San Francisco, Calif., and his residency in psychiatry at Walter Reed General Hospital, Washington, D.C. During his most recent assignment he was chief, Mental Hygiene Consultation Service, Fort Belvoir, Va.

Chest Physicians to Convene

The Southern Chapter of the American College of Chest Physicians will hold its annual meeting in St. Louis, Missouri, 30–31 October 1960. Physicians who wish to participate in the scientific sessions should submit titles of their papers and 200-word abstracts to Dr. M. Bedford Davis, Jr., 1293 Peachtree Street, N.E., Atlanta, Georgia, for the Surgical Section. Similar abstracts should be submitted to Dr. Alfred Goldman, 634 North Grand, St. Louis, Missouri, for the Clinical Section.

GREEK NURSE CORPS CHIEF VISITS ARMY SURGEON GENERAL. Lieutenant Colonel Cleopatra Avayanou, organizer and chief of the Queen Fredericka Nurse Corps of the Greek National Army, visited Lieutenant General Leonard D. Heaton, Army surgeon general, during her recent 2-month tour of the United States. Sponsored by the Military Assistance Group, her trip included visits with the chiefs of Army, Navy, and Air Force Nurse Corps, and tours of the medical centers of the 3 services.

Yearbook Selects Army Paper

A recently published article entitled "Generalized Shwartzman-like reaction following *Serratia marcescens* septicemia in a fatal burn," written by 3 members of the Surgical Research Unit staff at Brooke Army Medical Center, Fort Sam Houston, Texas, has been chosen for inclusion in the 1960 *Year Book of Medicine.*

The authors, Lieutenant Colonel Charles D. Graber, MC, USA, chief, Bacteriology Division, Lieutenant Colonel Wilford T. Tumbusch, MC, USA, chief, Clinical Division, and Colonel Edward H. Vogel, Jr., MC, USA, commander of the unit, describe what they believe to be the first report of hypersensitivity in man involving an organism, *Serratia marcescens*, rarely seen in human infections.

Selected for the Year Book by the editor, Dr. Paul Beeson, professor of medicine at Yale University, the article will be included in a compilation of the significant medical papers of the past year.

Deaths

CANFIELD, EMILY MELIA, Captain, ANC, USAR, of South Dennis, Massachusetts; assigned as head nurse, Cardiovascular Ward, Walter Reed General Hospital, Washington, D.C.; graduated in 1930 from the Newton Hospital School of Nursing, Newton, Massachusetts; appointed a second lieutenant in the Army of the United States and reported for active duty 18 June 1942; died 24 March 1960, aged 54, at Walter Reed General Hospital, of carcinoma of the lung.

DALTON, RUTH DOROTHY, Captain, ANC, USAR, of Paragonah, Utah; assigned to the 34th General Hospital, France; graduated in 1939 from Holy Cross Hospital School of Nursing, Salt Lake City, Utah; appointed a second lieutenant in the Army of the United States, 3 July 1943; reported for active duty 15 July 1943; died 14 April 1960, aged 43, of pulmonary carcinomatosis, in France.

MORGAN, NORMAN DANIEL, JR., Captain, AFRes, MC, of San Francisco, California; assigned to the 829th Medical Group, Larson Air Force Base, Washington; graduated in 1957 from the Stanford University School of Medicine; appointed a first lieutenant and reported for active duty in the Air Force Reserve 3 July 1959; died 27 February 1960, aged 28, between Klamath Falls, Oregon, and San Francisco, in a civilian aircraft accident.

STRAIN, RUTH GLADYS, Lieutenant Colonel, AMSC, of Pittsburgh, Pennsylvania; assigned as chief, Food Service Division, Letterman General Hospital, San Francisco, California; graduated in 1933 from Carnegie Institute of Technology, Pittsburgh, Pennsylvania; appointed as a second lieutenant in the Army of the United States and reported for active duty 19 September 1944; commissioned a captain in the United States Army 10 March 1958; died 17 February 1960, aged 49, at Letterman General Hospital, of malignant melanoma.

VAN ELMENSDORG, JOHN CARL, First Lieutenant, MSC, USA, of Marietta, Georgia; assigned to the 517th Medical Company, USAREUR; graduated in 1957 from the University of Georgia; appointed a second lieutenant in the United States Army Reserve 10 July 1957; reported for active duty 9 March 1959; commissioned a second lieutenant in the United States Army 22 June 1959; died 1 May 1960, aged 24, at Walter Reed General Hospital, Washington, D.C., of glioma of the thalamus.

Officers Certified By Specialty Boards

The surgeons general of the military medical services have announced that the following regular Medical Corps officers have been certified by the specialty boards indicated:

American Board of Dermatology

Davis, Richard G., Lt., USN
Marty, Sophocles D., Lt., USN
Parker, Alden R., Lt., USN

American Board of Pathology

Hyams, Vincent J., Lt., USN

American Board of Pediatrics

Eckert, Herbert L., Lt. Comdr., USN
Hilty, George R., III, Lt., USN
Parke, James C., Jr., Lt., USN
Nielson, O. F., Comdr., USN

American Board of Surgery

Feinberg, Sherwood E., Capt., USA
Geiger, James P., Capt., USA
Gomez, Alphonse C., Capt., USA

NURSE ANESTHETISTS GRADUATE AT WALTER REED GENERAL HOSPITAL. Major General C. F. St. John, MC, USA, commanding general, Walter Reed Army Medical Center, Washington, D.C., presents graduation certificates to 6 Army and Air Force nurses following completion of the 1-year course in anesthesiology. Left to right are: First Lieutenant Leonard Williams, assigned to Tripler Army Hospital, Hawaii; Lieutenant Colonel Ruth P. Satterfield, course director; First Lieutenant Sally Mullen, going to Fort Campbell Army Hospital, Ky.; First Lieutenant Richard Karwoski, to Valley Forge General Hospital, Pa.; General St. John; Captains Eleanor Gallagher, Martin Army Hospital, Fort Benning, Ga.; Elisa Camacho-Hernandez, Fort Carson Army Hospital, Colo.; and Jacqueline Brodie, USAF, USAF Hospital, Keesler Air Force Base, Miss.; and Colonel Harvey C. Slocum, chief, Anesthesiology Section, Walter Reed General Hospital.

Official Decorations

The following awards were recently announced by the Departments of the Army, Navy, and Air Force.

Legion of Merit

Corliss, Arthur H., Col., USAF, MC
Lay, Frances I., Col., USAF, NC

Navy and Marine Corps Medal

Vincent, John T., Lt. Comdr., MC, USN

Army Commendation Ribbon With Metal Pendant

Girard, Pauline H., Lt. Col., ANC
McGraw, Doris, ANC, USAR
Smarr, Wyatt C., Major, MSC, USA

Commendation Ribbon with Metal Pendant

Drabkin, Joel W., Lt., MC, USN
Ruseski, Peter P., Lt., MC, USN
Sparkes, Robert S., Lt., MC, USN

Progress Notes

Colonel **Aniello F. Mastellone,** MC, USA, chief, Physical Medicine Service, Walter Reed General Hospital, Washington, D.C., has departed for a new assignment at Tripler Army Hospital, Hawaii . . . Captain **Robert J. Whipple,** MC, USN, U.S. Naval Hospital, Portsmouth, Va., has joined the staff of the Commander Service Force, U.S. Atlantic Fleet, Norfolk, Va. . . . Commander **James P. Semmens,** MC, USN, and Lieutenant Commander **Richard B. Speaker,** MC, USN, U.S. Naval Hospital, Charleston, S.C., have been certified as diplomates of the American Board of Obstetrics and Gynecology.

Major General **Robert H. Mills,** DC, USA, Ret., former Army Dental Chief, and one-time director of Army Post-Graduate School of Dentistry, Walter Reed Army Institute of Research, Washington, D.C., has been awarded the annual Distinguished Alumni Award, by the Alumni Association of the Baltimore College of Dental Surgery Dental School, University of Maryland . . . Colonel **George M. Leiby,** USAF, MC, has been named Special Assistant for Reserve Affairs to the Air Force Surgeon General.

Captain **Reginald R. Rambo,** MC, USN, Control and Planning Division, Bureau of Medicine and Surgery, Washington, D.C., has been reassigned as District Medical Officer, Tenth Naval District, San Juan, Puerto Rico . . . Captain **Arthur J. Draper,** MC, USN, has been elected a fellow in the American College of Chest Physicians . . . Lieutenant Colonel **Miriam C. Schaupp,** ANC, has assumed duties as the new chief of Nursing Service at Fort Benning's Martin Army Hospital. She succeeds Lieutenant Colonel **Pauline H. Girard,** ANC, who has departed for Fort Monmouth, N.J., where she will become chief nurse at Patterson Army Hospital.

Major General **William E. Shambora,** MC, USA, commanding general, Brooke Army Medical Center, Fort Sam Houston, Texas, was one of three prominent Americans awarded honorary degrees of doctor of law at the 1960 commencement of St. Mary's University, San Antonio . . . Captain **William A. Smith,** DC, USN, Naval Supply Center, Bayonne Annex, N.J., is the new commanding officer of the Naval Dental Clinic, Naval Base, Philadelphia, Pa.

Brigadier General **Victor Solano Castro,** director of the Central Military Hospital of the Peruvian Army, was a recent visitor to Brooke Army Medical Center, San Antonio, Texas . . . Captain **Joseph M. Copoletta,** MC, USN, U.S. Naval Hospital, Oakland, Calif., has been assigned as commanding officer, Naval Medical Research Unit No. 1, University of California.

The 21st class in hospital administration was graduated at the U.S. Naval School of Hospital Administration, National Naval Medical Center, Bethesda, Md., in June. The graduation address was given by Vice Admiral **Oswald Colclough,** USN (Ret.), acting president and Dean of Faculties, George Washington University. Rear Admiral **Bartholomew W. Hogan,** MC, USN, surgeon general and chief, Bureau of Medicine and Surgery, Washington, D.C., presented the 41 graduates with certificates of completion.

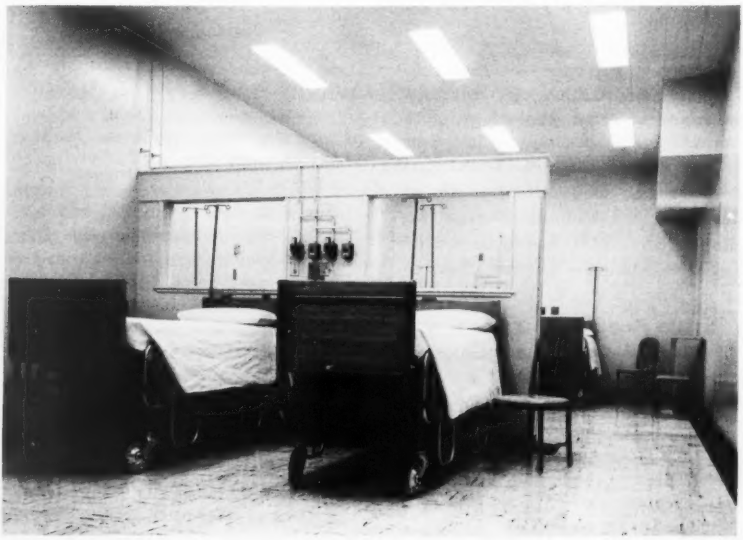
Lieutenant Colonel **Hinton J. Baker,** MC, USA, formerly of the Bacteriology Division, Walter Reed Army Institute of Research, Washington, D.C., is now with the Institute for Medical Research, U.S. Army Medical Research Unit, Kuala Lumpur, Malaya.

AMSS Teaches Buddy Care

A 5-day course in emergency medical care for nonmedical personnel was held at Brooke Army Medical Center, San Antonio, Texas, 13–17 June, for representatives of military posts throughout the Fourth U.S. Army area.

This course marks the beginning of the Army Medical Service School's Army-wide program to teach emergency medical care to all Army personnel. More than 50 representatives returned to their parent organizations upon completion of instruction to teach men in their units basic procedures in self care and buddy aid. These relatively simple actions, applied promptly after injury, will give many injured soldiers the chance to survive until professional medical help is available.

Subjects covered included control of hemorrhage and shock, maintaining a free airway and mouth-to-mouth resuscitation, treatment of burns, splinting of fractures, bandaging of wounds, care of special types of wounds, intramuscular injection technic, common medical emergencies, transportation of the sick and wounded, preventive medicine aspects of disaster, chemical-biologic-radiologic warfare, control of pain and indications for administering morphine, management of mass casualties, and psychologic first aid.



NEWLY OPENED THORACIC SURGERY CLINIC. Shown above is one of the intensive treatment rooms in the new Thoracic Surgery Clinic at Walter Reed General Hospital, Washington, D.C. The ward has been redesigned to provide specialized treatment for the care of patients following thoracic surgery and includes an operating room, laboratory, classroom, doctors' offices, and normal recovery room. The 26-bed clinic is air-conditioned and pastel colors are used to provide a pleasant, harmonious décor.

The Medical Officer Writes

Articles Published in Other Journals

U.S. Army

SELF AID AND FIRST AID TRAINING; A NEW DOCTRINE FOR NON-MEDICAL PERSONNEL. Colonel Arnold L. Ahnfeldt, MC, USA, Office, Chief of Army Field Forces, Europe. *Military Medicine*, March 1960.

CONCERNING THE MECHANISM OF COMPLEMENT ACTION. V. Early Steps in Immune Hemolysis. Elmer L. Becker, M.D., Walter Reed Army Institute of Research, Washington, D.C. *Journal of Immunology*, March 1960.

"WHICH ERRING MEN CALL CHANCE." Frank B. Berry, M.D., Assistant Secretary of Defense (Health and Medical), Washington, D.C. *Aerospace Medicine*, February 1960.

USE OF POLYETHYLENE PLASTIC BAGS FOR STORAGE OF PATHOLOGIC TISSUE. Major Charles B. Broadway, USAF, MSC, and Master Sergeant Donald G. Koelle, USA, Ret., U.S. Armed Forces Institute of Pathology, Washington, D.C. *American Journal of Clinical Pathology*, March 1960.

STEROID-INDUCED ADRENAL INSUFFICIENCY AGGRAVATED BY SEVERE MEDICAL ILLNESS. Captain Robert S. Capper, MC, USA, and Major Robert H. Moser, MC, USA, Brooke General Hospital, Fort Sam Houston, Texas. *American Journal of the Medical Sciences*, March 1960.

GIVE YOUR STUDENTS A SIMULATED PATIENT TO TREAT. Major Samuel L. Crook, Sr., MSC, USA, U.S. Army Medical Service School, Europe. *Military Medicine*, March 1960.

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EFFICIENT HEPARIN ASSAY FOR MONITORING REGIONAL HEPARINIZATION AND HEMODIALYSIS. Captain John P. Darby, Jr., USAF, MC, Captain Robert J. Sorensen, MC, USA, Captain Thomas F. O'Brien, MC, USAR, and Major Paul E. Teschan, MC, USA, Brooke Army Medical Center, Fort Sam Houston, Texas. *New England Journal of Medicine*, March 31, 1960.

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STUDIES ON PASTEURELLA TULARENSIS, I. EFFECT OF DUOLITE TREATMENT ON GROWTH PROMOTING PROPERTIES OF BLOOD AND PLASMA. Lieutenant Andrew J. Gaspar, MSC, USN, Commander Martha K. Ward, USPHS, and Hugh

Titles of articles in current periodicals written by commissioned officers and civilian scientists in the medical services of the Department of Defense will be published each month insofar as space permits. This listing is gleaned from available periodicals and is not necessarily complete. Authors desiring inclusion of published articles are invited to send a reprint to the *Journal*.—EDITOR.

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GENERALIZED SHWARTZMAN-LIKE REACTIONS FOLLOWING SERRATIA MARCESCENS SEPTICEMIA IN A FATAL BURN. Major Charles D. Graber, MSC, USA, Major Wilfred T. Tumbusch, MC, USA, First Lieutenant Richard P. Rudnicki, MC, USA, and Lieutenant Colonel Edward H. Vogel, Jr., MC, USA, Brooke Army Medical Center, Fort Sam Houston, Texas. *Surgery, Gynecology and Obstetrics*, April 1960.

FURACIN (NITROFURAZONE) VAGINAL SUPPOSITORIES IN OPERATIVE GYNECOLOGY. Captain Hugh Gavin Grimes, MC, USA, and Clyde J. Geiger, M.D., Stritch School of Medicine, Loyola University, and St. Joseph Hospital, Chicago, Ill. *American Journal of Obstetrics and Gynecology*, March 1960.

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DIAGNOSIS AND TREATMENT OF TESTICULAR TUMORS. Colonel John F. Patton, MC, USA, Captain David N. Seitzman, MC, USA, and Captain Robert A. Zone, MC, USA, Walter Reed General Hospital, Washington, D.C. *American Journal of Surgery*, April 1960.

THE U.S. ARMY DENTAL CORPS. Colonel Edwin H. Smith, Jr., DC, USA, Office of the Surgeon General, U.S. Army. *Journal of the American Dental Association*, March 1960.

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U.S. Navy

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THE EFFECT OF INTRAVENOUS PARALDEHYDE AS RECORDED BY THE CHEST X-RAY FILM. A CASE REPORT. Lieutenant Jerome A. Gold, MC, USNR, Lieutenant Robert C. Garcia, MC, USN, and Lieutenant John W. Davis, MC, USN, U.S. Naval Hospital, Bethesda, Md. *Diseases of the Chest*, April 1960.

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SUBMARINE MEDICINE MEN. Rear Admiral Bartholomew W. Hogan, MC, USN, Surgeon General, U.S. Navy. *Life and Health*, June 1960.

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THE USE OF BOVINE HETEROGRAFTS AS ARTERIAL REPLACEMENTS. Lieutenant John D. Johnson, MC, USN, Howard D. Easling, M.D., and Paul Nemir Jr., M.D., Graduate School of Medicine, University of Pennsylvania. *A.M.A. Archives of Surgery*, April 1960.

THE MANAGEMENT OF VICTIMS OF RADIATION ACCIDENT. Captain Elmer R. King, MC, USN, U.S. Naval Hospital and U.S. Naval Medical School, Bethesda, Md. *Southern Medical Journal*, April 1960.

RANDOM COMMENTS ON EXFOLIATIVE CYTOLOGY. Lieutenant Laudie E. McHenry, MC, USN, U.S. Naval Hospital, Jacksonville, Fla. *Electro Lyte*, April 1960.

SOME FUNDAMENTALS OF RADIOLOGIC PHYSICS. Lieutenant Thomas G. Mitchell, MSC, USN, U.S. Naval Hospital, Bethesda, Md. *Southern Medical Journal*. April 1960.

DIET AND THE ABDOMINAL CRISIS IN ESSENTIAL HYPERLIPEMIA. Lieutenant Ralph L. Nachman, MC, USNR, U.S. Naval Hospital, Newport, R.I. *Rhode Island Medical Journal*, April 1960.

ASSOCIATION OF MYASTHENIA GRAVIS AND HYPERTHYROIDISM, SHOWING RECIPROCAL RELATIONSHIP: REPORT OF A CASE AND REVIEW OF THE LITERATURE. Captain Jacob John Robbins, MC, USN, and Captain Joseph S. Burkle, MC, USN, U.S. Naval Hospital, St. Albans, N.Y. *Annals of Internal Medicine*, April 1960.

THE U.S. NAVY DENTAL CORPS. Rear Admiral Curtiss W. Schantz, DC, USN, Bureau of Medicine and Surgery, U.S. Navy. *Journal of the American Dental Association*, March 1960.

U.S. Air Force

SERUM LIPIDS AND LIPOPROTEIN CONCENTRATIONS IN MILITARY ACADEMY GRADUATES—TRENDS FROM 1952 THROUGH 1958. Margaret F. Allen, M.S., Colonel Lawrence J. Milch, USAF, and the Cardiovascular Research Group, USAF School of Aviation Medicine, Brooks Air Force Base, Texas. *Military Medicine*, March 1960.

DISRUPTION OF MUSCLES AND TENDONS. Captain Sanford H. Anzel, USAF, MC, Kenneth W. Covey, M.D., Alan D. Weiner, M.D., and Paul R. Lipscomb,

M.D., The Mayo Foundation, Graduate School of the University of Minnesota, Rochester, Minn. *Surgery*, March 1959.

SPACE MEDICINE. Captain Jack H. Bates, USAF, MSC, and Captain Daniel H. Keller, USAF, MC, School of Aviation Medicine, USAF, Randolph Air Force Base, Texas. *Life and Health*, May 1960.

HELICOPTER PROBLEMS: NOISE, COCKPIT CONTAMINATION AND DISORIENTATION. Major Charles A. Berry, USAF, MC, and Major Herbert K. Eastwood, USAF, MC, USAF School of Aviation Medicine, Brooks Air Force Base, Texas. *Aerospace Medicine*, March 1960.

EXPERIENCES WITH A FINGER-JOINT PROSTHESIS. Colonel Earl W. Brannon, USAF, MC, and Gerold Klein, M.D., Lackland Air Force Hospital, San Antonio, Texas, and Wiesbaden, Germany. *Journal of Bone and Joint Surgery*, January 1959.

ANTEPARTUM THROMBOPHLEBITIS TREATED BY LONG-TERM USE OF BISHYDROXYCOUMARIN. Captain Ronald Feldman, USAF, MC, and Captain Lloyd Smith, USAF, MC, Brookley Air Force Base, Ala. *American Journal of Obstetrics and Gynecology*, April 1960.

NUTRITION RESEARCH FOR THE SPACE TRAVELER. Beatrice Finkelstein, Air Research and Development Command, Wright-Patterson Air Force Base, Ohio. *Journal of the American Dietetic Association*, April 1960.

SPECIFIC CORD DAMAGE AT THE ATLAS LEVEL AS A PATHOGENIC MECHANISM IN CEREBRAL CONCUSSION. Reinhard L. Friede, M.D., Aerospace Medical Laboratory, Wright-Patterson Air Force Base, Ohio. *Journal of Neuropathology and Experimental Neurology*, April 1960.

SIMPLIFICATION OF CERTAIN ASPECTS IN THE PERFORMANCE AND INTERPRETATION OF COMPLEMENT-FIXATION TESTS. Howard S. Friedman, Ph.D., 7520th USAF Hospital, London, England. *American Journal of Clinical Pathology*, March 1960.

THE USE OF DETECTORS AND TEST KITS IN INDUSTRIAL HYGIENE INVESTIGATIONS. J. Brennan Giselard, Wright-Patterson Air Force Base, Ohio. *A.M.A. Archives of Industrial Health*, March 1960.

IDIOPATHIC PULMONARY HEMOSIDEROSIS. Captain Victor Gurewich, USAF, MC, and Captain Martin A. Thomas, USAF, MC, USAF Hospital, MacDill Air Force Base, Tampa, Fla. *Modern Medicine*, April 15, 1960.

ROENTGENOGRAPHIC STUDY OF HUMAN SUBJECTS DURING TTANSVERSE ACCELERATIONS. Captain Edward J. Hershgold, USAF, MC, Aerospace Medical Laboratory, Wright-Patterson Air Force Base, Ohio. *Aerospace Medicine*, March 1960.

THE BIO-EFFECTS OF RADAR ENERGY, A RESEARCH PROGRESS REPORT. Colonel George M. Knauf, USAF, MC, USAF Missile Test Center, Patrick Air Force Base, Fla. *Aerospace Medicine*, March 1960.

WHAT EVERY DOCTOR SHOULD KNOW ABOUT "FALLOUT." Lieutenant Colonel David I. Livermore, USAF, MC, Office of the Surgeon General, Headquarters USAF, Washington, D.C. *Southern Medical Journal*, April 1960.

STUDIES ON MILIARIA RUBRA. Colonel Robert E. Lyons, USAF, MC, Lieutenant Colonel Robert Levine, USAF, MC, and Captain Marvin A. Lutzner, USAF, MC, Lackland Air Force Base, Texas. *A.M.A. Archives of Dermatology*, March 1960.

PERIDONTAL DISEASE AND DIABETES IN YOUNG ADULTS. Captain Ralph C. Williams Jr., USAF, MC, and Major Charles J. Mahan, USAF, DC, USAF Hospital, Maxwell Air Force Base, Ala. *Journal of the American Medical Association*, February 20, 1960.

Correspondence

San Antonio, Texas

Dear Sir:

I have read with considerable interest, in the February 1960 number of your *Journal*, the article entitled "Sting of a Venomous Lionfish."

This incident happened on Parry Island, Eniwetok Atoll in the Pacific during Operation Ivy when the first full scale hydrogen bomb was tested by Joint Task Force 132 (later renumbered 7). I was the commander of Joint Task Force 132 (atomic).

I was swimming with others, including the victim of the incident described, in the lagoon over the beautiful coral heads where there were many highly colored tropical fish including some lionfish. I suddenly saw a man thrashing wildly, swimming for the beach, obviously in trouble. I followed. He got out rubbing his hand and arm saying, "I never had anything hurt quite so much." When asked what had happened, he said he tried to pat a lionfish and it stung him.

I had my jeep and, seeing he was in great pain, I had him get in and took him to our little hospital as fast as I could. He continued in great pain and all the doctors assembled, including Major Lifton, USAF, who was my Task Force staff surgeon and one of the co-authors of your article.

The medical symptoms are described in the article, but I might add that the doctors thought that evening the victim "had had it."

Needless to say, after the incident, none of the rest of us tried to "pat" any lionfish.

PERCY W. CLARKSON
MAJOR GENERAL, U.S. ARMY (RETIRED)
FORMER COMMANDER, JOINT TASK FORCE 132 (7).

USAF Hospital Tachikawa
APO 323, San Francisco, California

Dear Dr. Herzmark:

Your letter to the editor of the *U.S. Armed Forces Medical Journal* [published in the *Journal*, July 1960, p. 830] was forwarded to me. The Clay-Adams Company were able to furnish me with a single-page advertisement regarding the traction reel. They also noted that the product had been discontinued from their line for some years. The similarity between your device and one we were working with is unmistakable. Prior to publication, a careful patent search had been made, and several types of traction devices were studied, but their structure was different from the one we were working on. Many of the people consulted on this problem were old timers in the patient evacuation business, including naval officers, and none of them pointed out to us that there was a previous similar model. I did not have access to the bulletin in which your original work was published, and having no library loan facilities at this overseas station, have been unable to obtain a copy. It is possible that the only new feature, which we are presenting, are the modifications which adapt this type of traction apparatus to the Stryker frame and litter.

For the safety and well being of our patients in transit with injuries to the cervical spine, we hope to continue to work with and improve our traction apparatus. I am most anxious, however, for you to receive credit for the original work with this device.

WILLIAM I. SILVERNAIL
CAPTAIN, USAF, MC, FS

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Calendar Of Coming Medical Meetings

1960

August

UCLA School of Medicine Symposium on Anesthesiology, 3–5 Aug., Los Angeles, Calif.

13th Annual Meeting of the American Society of Blood Banks, 21–26 Aug., San Francisco, Calif.

Oak Ridge Introductory Symposium on Thermonuclear Plasma Physics, 22–26 Aug., Gatlinburg, Tenn.

6th International Congress on Internal Medicine, 24–27 Aug., Basel, Switzerland.

5th European Congress of Aviation Medicine, 29 Aug.–2 Sept., London, England.

September

4th National Cancer Conference, 13–15 Sept., University of Minnesota, Minn.

Inter-Society Cytology Council Meeting, 23–25 Sept., Chicago, Ill.

October

29th Annual Meeting of the American Academy of Pediatrics, 15–20 Oct., Chicago, Ill.

Symposium on the Medical and Biological Aspects of the Energies of Space, 24–25 Oct., San Antonio, Texas.

American College of Gastroenterology Course in Postgraduate Gastroenterology, 27–29 Oct., Philadelphia, Pa.

67th Annual Convention of the Association of Military Surgeons of the United States, 31 Oct.–2 Nov., Washington, D.C.

November

6th Pakistan Medical Conference, 25–28 Nov., Karachi, Pakistan.

Chairmen of committees are invited to submit notices of forthcoming medical meetings to be published each month insofar as space permits. This listing is compiled from notices received by the Journal and is not necessarily complete. Chairmen are reminded that material should be in this office at least 2 months prior to date of meeting.—Editor.

PHILISTINE PHYSICIAN

Zealots for culture may need to be reminded that Hopkins' great dean, Professor William Welch, devoted many hours each week to whist during his academic years, preferred baseball to Brahms, and burlesque to Chekov.—William Dock: Curiosity, Culture, and Curricula. *The Journal of the American Medical Association*, February 13, 1960.

This Is Your A. M. A.

THE COUNCIL ON MEDICAL SERVICE of the American Medical Association was established as a direct result of the forward-looking vision of delegates from numerous states seeking to expand medical care activities within the Association and among the constituent state associations; to place more stress on public relations, especially in regard to legislation; and to provide for representation of the medical profession in the nation's capital. Many resolutions introduced over a period of years culminated, in June 1943, in the creation of a standing committee of the House of Delegates, entitled the "Council on Medical Service and Public Relations."

To carry out its functions, the Council, in 1944, opened a Washington office, officially representing the Association. It also established a "Medical Services Newsletter," and initiated a continuing series of regional conferences designed to stimulate and assist the constituent associations in the development of public relations programs and medical care programs, including prepayment plans.

Some of the initial projects of the Council expanded and attained such a degree of importance as to be made separate operating units. In 1946, a separate department of public relations was created within the Association. In the same year, the Blue Shield Commission was created to coordinate the work with medical society prepayment plans. In 1947, the "Newsletter" became a direct operation under the Association secretary. In 1949, the Washington office was transferred to the Board of Trustees.

The activities of the Council, however, have continued to expand and, in 1948, the House of Delegates authorized the creation of 7 Council committees to better coordinate these activities and to provide a wide representation of physicians in the Council's studies and planning. Subsequently, the Committee on Aging has been added and the Committee on Insurance and Prepayment Plans has replaced 2 previous committees, Prepayment Medical and Hospital Service and Relations with Lay-Sponsored Voluntary Health Plans.

Members of the Council are elected by the House of Delegates on a geographic basis. The Council selects the committee members not only to secure geographic representation but also the special experience and knowledge required for each committee. Professional and lay consultants also serve a number of the committees.

Each committee is responsible for keeping abreast of trends in its area of medical service, reporting on developments to the profession and public, and making recommendations to the Council.

Committee on Insurance and Prepayment Plans

This committee maintains data on prepayment plans and health insurance generally, and maintains liaison with Blue Shield and the Health Insurance Council. In addition, it studies the many problems incident to other forms of insurance that involve physicians, such as disability, life, professional liability, and the like. Recent publications include: "A Buyer's Guide to Voluntary Health Insurance"; "Hospital, Surgical and Medical Expense Benefit Plans"; and "Disability Insurance." The Committee has also issued a statement entitled, "Let's Use, Not Abuse," in regard to voluntary health insurance.

From the Council on National Security of the American Medical Association. The views and opinions expressed are not necessarily those of the Department of Defense.—EDITOR.

Committee on Aging

The Committee on Aging is concerned with improving health care of the aged and with encouraging medical societies and others to stimulate research, community projects, and educational programs designed to expand opportunities for continued good health and meaningful living among older people. To this end, the Committee has drafted a 6-point program for action by the medical profession at all levels, that calls for: (1) stimulation of a realistic attitude toward aging by all people; (2) promotion of health maintenance programs and wider use of restorative and rehabilitative services; (3) extension of effective methods of financing health care for the aged; (4) expansion of skilled-personnel training programs and improvement of medical and related facilities for older people; (5) amplification of medical and socioeconomic research in problems of the aging; and (6) leadership and cooperation in community programs for senior citizens.

The Committee in 1959–60 cosponsored with state medical societies a series of 9 regional conferences on aging, involving both professional and lay groups. These conferences were directed toward stimulating broader understanding of the true needs and the increased health and abilities of older people. The Committee publishes a bimonthly "Chronic Illness Newsletter" to report on community programs for prevention, care, and rehabilitation of chronic disease.

Committee on Medical Facilities

This committee is responsible for assessing a great variety of health services involving facilities, such as hospitals, health departments, and nursing homes. The Committee recently completed a study of the first 10 years of Hill-Burton hospital operation. Among its present projects are: (1) a re-examination of public health department activities as related to Association policy; (2) a study of the trend toward locating physicians' offices in or adjacent to hospitals and its impact on private practice; (3) a study of the practice of using community funds to pay for hospital care for medically indigent patients, through the use of a service referred to as the "central hospital bureau"; and (4) a study of nursing homes, in cooperation with the American Nursing Home Association.

In addition, the Committee directs the policies of the Physicians Placement Service, which assists physicians in seeking a location for practice, and aids communities looking for a physician. The Committee also publishes a bimonthly "Homemaker Services Bulletin" to report on programs of this type throughout the country.

Committee on Indigent Care and Committee on Federal Medical Services

These committees are both concerned with the socioeconomic aspects of governmental medical programs. The former deals with the various state and local programs that assist in financing medical care and hospital and auxiliary services for the needy, and with such Federal legislation as affects these programs. The latter is concerned with Federal medical programs that provide medical care or services to nonindigent citizens, and with the relationship of physicians in private practice to other Federal programs. Federal medical programs pertaining to the military are the concern of the Council on National Security, which maintains liaison with the Committee on Federal Medical Services.

The Committee on Indigent Care acts as an information center for the state and county medical societies concerning developments in public welfare programs; establishes liaison with the various national agencies in the field, both professional and governmental; and conducts field studies of the various individual programs.

The Committee has sponsored regional meetings at which local welfare agency and medical representatives can discuss their mutual problems.

The Committee on Federal Medical Services includes within its area of interest the medical, educational, and research programs financed or carried on by the Federal Government in the field of health. Specifically, it maintains a continuing study of such programs as the hospital and outpatient care program of the Veterans Administration, and medical programs for the American Indian, merchant seamen, and dependents of uniformed personnel (Medicare). The Committee has also concerned itself with medical education and research in Federal facilities, particularly those of the Veterans Administration and the U.S. Public Health Service.

The Committee's responsibilities include carrying out A.M.A. policy in regard to these programs; keeping informed on new developments and establishing liaison with the administrators of Federal programs; reviewing and studying programs in reference to A.M.A. policy; informing constituent medical associations of new developments and working with them in their relations to the programs; and suggesting changes, where indicated. It publishes a "Newsletter" and has also published numerous leaflets and pamphlets in regard to A.M.A. policy concerning Federal medical programs.

Committee on Maternal and Child Care

The Committee on Maternal and Child Care is responsible for keeping informed on studies and research designed to improve maternal, infant, and child health and to compile and publicize this information. It has published many articles and compiles booklets for use by practicing physicians, hospitals, and health departments. The latest is a "Guide for Perinatal Studies."

Committee on Medical Care for Industrial Workers

This is a joint committee of the Council on Medical Service and the Council on Occupational Health. Its primary focus has been a study of the problems of relationships between various union-sponsored and management-sponsored medical care programs and the medical profession. It has also concerned itself with a number of other problem areas that are of mutual interest to the two councils.

The Committee has undertaken surveys, conferences, and other activities with labor and management personnel and has developed guides to relationships with union and management health programs. Other studies have to do with work absence, small plant occupational health programs, temporary disability insurance programs, executive health examinations, and multiphasic screening. Guides for measuring data and defining terms as related to work absence have been published.

All committees hold such regional and national conferences as are necessary to further their responsibilities. All policy recommendations are made to the Council on Medical Service and, in turn, to the House of Delegates or Board of Trustees of the American Medical Association.

BETTER THAN APPLES

Joy, and Temperance and Repose,
Slam the door on the doctor's nose.—Henry W. Longfellow

Book Reviews

SURGICAL PHILOSOPHY IN MASS CASUALTY MANAGEMENT, with Detailed Notes on Practical Care, by *Warner F. Bowers*, A.B., B.Sc., M.D., M.S., Ph.D., and *Carl W. Hughes*, A.B., M.D. 204 pages. Charles C Thomas, Publisher, Springfield, Ill., 1960. Price $6.75.

Born of war, stimulated by fear of thermonuclear weapons, disaster medicine and its associated literature have grown fitfully during the past 15 years. This short volume on mass casualty management is the natural outgrowth of the increasing interest in this field. As the authors state in their introduction, no one can be considered an expert in this area of medical care, because no one has had actual experience in dealing with the mass casualties of nuclear disaster. On this basis, the authors have gathered together and have expanded upon the thoughts and writings of many who have devoted considerable time to work in this field. As its title implies, this is not a "How to Do It" manual. Instead, it attempts to present the reasoning and principles underlying our present philosophy in regard to mass casualty management. Divided into 10 chapters, the heart of this volume lies in the chapters entitled "Characteristic Effects of Trauma," "Principles and Importance of Sorting," "Treatment Groups," and "Surgical Compromises Required in Mass Casualty Care." Written almost entirely in narrative style, this book can easily be read in one sitting. Since this volume is the first of its kind available to the medical profession at large through a medical publisher, it may aid in overcoming the apathy of the profession toward the problems of mass casualty management.

LT. COL. H. HASKELL ZIPERMAN, MC, USA

HISTOLOGICAL AND HISTOCHEMICAL TECHNICS, by *Harold A. Davenport*, M.D. 401 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1960. Price $7.

Described in the preface as a text for the undergraduate student and technician, this handbook serves its purpose excellently. In part 1 procedures for all phases of tissue preparation are presented step by step, from procurement of the specimen through the most useful technics of fixation, embedding, sectioning, mounting, and staining. An adequate number of black-and-white photographs and line drawings illustrate the text and clarify some of the more complex procedures. In part 2 the formulas of the most widely used fixing fluids and staining solutions are given and their characteristics and some of their specific applications are delineated. Part 3 is an introduction to the rapidly growing field of histochemistry, with emphasis on the mechanism determining the reactions of ions, radicals, or molecular configurations. Stress is placed throughout the book on the reason for each step, and an honest attempt has been made to eliminate as many as possible of the illogical almost superstitious rituals, inherited through generations of old wives' tales, that clutter histologic technic as practiced in the average laboratory. This is not intended as a comprehensive recipe book; it is rather a gateway into histologic procedure for the novice technician who does not have access to instruction by direct precept and example or for the one who desires to know more about the why and wherefore than the average senior technician can teach. For those who are stimulated to acquire a larger repertoire or to delve deeper into certain areas, the bibliography should be a useful guide. MAY SHERMAN, M.D.

CHEMICAL MICROMETHODS IN CLINICAL MEDICINE, by *R. H. Wilkinson*, M.A., M.D. 121 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1960. Price $5.

Micromethods are defined by the author as being those methods that require 0.1 to 0.5 ml of specimen (serum or plasma). He finds that relatively little practice is needed to collect approximately 1 ml of blood by skin puncture. The appropriate blood collection methods are described and illustrated. Separate analyses are generally performed on 0.02 and 0.2 ml of the resultant serum or plasma. Most often, the volume of the latter employed in a single determination does not exceed 0.1 ml. The many micromethods described in this book have been shown to be suitable for use in a routine hospital laboratory and to be applicable to both venous and capillary blood. Several suggestions are made concerning the economical use of the blood available for analysis, such as the use of whole blood or of red cells for the determination of urea. Considerations affecting the accuracy and sensitivity of micromethods, and the training of personnel in the use of such procedures, are also discussed. Somewhat more than half of this small text is devoted to a description of micromethods for the determination of those blood, urine, and cerebrospinal fluid components normally dealt with in the routine hospital laboratory. The 8 chapters dealing with methodology provide essentially conventional groupings of tests, based upon clinical uses; e.g., tests on liver function, bone metabolism, and renal function. This is a most timely book, in view of the mounting, earnest interest in chemical micromethods and ultramicromethods applied to the clinical laboratory. Those who contemplate a transition to either of the latter systems of analysis will find here a wealth of practical information and guidance.

COL. THADDEUS J. DOMANSKI, USAF, MSC

MAIL the June Reader Poll Questionnaire—*Now!*

ESSENTIALS OF REMOVABLE PARTIAL DENTURE PROSTHESIS, by *Oliver C. Applegate*, D.D.S., D.D.Sc., F.A.C.D. 2d edition. 364 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1959. Price $14.

Dr. Applegate is the leading proponent of the "physiologic basing" school of thought on partial dentures. The second edition of his book should prove much more popular than the first (1954), which was of unwieldly size and written in an unusual question-and-answer form. This edition uses the standard descriptive essay type of presentation. It contains considerable new material and is very well organized and thoroughly readable. The book is divided into 2 sections, with the bulk of the content being presented under the heading of fundamentals, and a small part under clinical procedure. There are over 450 illustrations, and the references, some as recent as December 1958, constitute a bibliography of partial denture literature. Dr. Applegate's book is unique among current texts in that he advocates the use of the wax impression for the saddle areas and the chewed-in principle for the occlusion. Although both of these technics have been used in

prosthodontics for many years, their acceptance has been far from general. This book, which describes in great detail the construction of a single partial denture against a natural or restored opposing arch, leaves to the reader's ingenuity the application of the chewed-in technic when the opposite arch requires another partial or a complete denture. It will do little to popularize these concepts. Disagree though one may on the routine applicability of these two technics, the book remains very profitable reading. It continually emphasizes the relationship of the mechanical factors to the physiology of the supporting tissues, and it is filled with practical suggestions of immediate use. The chapters on support, materials, examination, mouth preparation, and treatment planning are outstanding. The recommendations for the use of an exercise prosthesis to recondition sub-basal structures following disuse atrophy and of the chewed-in technic to reduce condylar displacements before the final occlusion is fixed are especially noteworthy. Although the second edition of Dr. Applegate's book is not the much-needed complete text on partial dentures, it deserves the attention of every serious student of prosthodontics. CAPT. WALTER J. DEMER, DC, USN

PHOTOGRAPHY IN MEDICINE, by *Arthur Smialowski*, and *Donald J. Currie*, M.D., M. Sc., F.R.C.S.E., F.R.C.S.(C.), D.S., F.A.C.S. 330 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1960. Price $14.50.

This is an excellent book. Although no single facet of medical photography is treated exhaustively, it covers the subject rather thoroughly. I feel it should be in the library of all medical illustrators and photographers and those in the medical and biologic professions who do their own photography. To the accomplished photographer wishing to specialize in medical photography, this book will also prove most helpful. It is well organized, with an excellent index and reference section. The illustrations are extremely good and all diagrams and line drawings are clear and simple. The printing, paper, and format are also good. A great deal of thought and care has gone into the preparation of the 282 illustrations that play an important part in the presentation of the subject material. From the planning of photographic departments, both large and small, to systematized filing and indexing of medical photographs, nothing is left out. There are chapters on macrophotography, photomicrography, gross specimen and cadaver photography, surgery, ophthalmology, and oral and dental photography. The author has even included a chapter on the photography of instruments and glassware and another on the preparation and projection of transparencies. Considerable attention has been given to clinical photography, proper equipment, lighting, and the positioning of patients. There has long been a need for a book such as this. HERMAN VAN COTT

THE HUMAN SPINE IN HEALTH AND DISEASE, translated and edited by *Stefan P. Wilk*, M.D., and *Lowell S. Goin*, M.D. Anatomicopathologic Studies, by *Georg Schmorl*, M.D. Clinicoradiologic Aspects, by *Herbert Junghanns*, M.D. 285 pages; illustrated. Grune & Stratton, Inc., New York, N.Y., 1959. Price $21.

This book represents a review of Schmorl's monumental work at the Dresden Institute of Pathology, where he studied over 10,000 spines at autopsy. In addition to gross specimens in toto, gross sections, radiographic studies, and microscopic sections, the histology of the vertebral body-disk junction, the water content of the nucleus pulposus, and the relation of degenerative changes in the annulus fibrosus to the prolapse of fragments of disk tissue are discussed. If one wished to study only the original work of Schmorl supplemented by that of Junghanns, he would have to use a red pencil and underline only original state-

ments made by these authors. There are so many concomitant cited references to other authors with supporting or conflicting ideas on etiology and experimental work that the text presents a somewhat disorganized picture, which could be simplified and presented as a lasting and worthwhile tribute to Schmorl and Junghanns alone. The 419 illustrations of radiograms, diagrams, and gross and microscopic specimens are all clear, cleancut, highly informative, and superb in every detail. The subject matter is well organized and well presented and, despite the numerous references to other authors, has much to offer the anatomist, roentgenologist, and orthopedic surgeon. This volume represents a most excellent reference work as well as an excellent text for residents in these three specialties. The authors of the translation should be highly complimented on their outstanding efforts in making this volume available to our profession.

COL. HAROLD S. MC BURNEY, MC, USA

FUNCTIONAL ANATOMY OF THE LIMBS AND BACK, A Textbook for Students of Physical Therapy and Others Interested in the Locomotor Apparatus, by *W. Henry Hollinshead*, Ph.D. 2d edition. 403 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1960. Price $9.

I have used the first edition of this book in teaching anatomy to physical therapy and occupational therapy students. The material presented on anatomy is excellent and well grasped by the students. I believe this second edition surpasses the 1951 edition in being more complete. The material is presented in a simple manner and is readily understood. The concept of functional anatomy is most effective. The nerves and muscles are well outlined in tabular form. The author has added considerable valuable information to this edition. An outline of synonyms is always advantageous to the prospective student. The new discussion of the ductless glands is concise and informative and provides for better understanding of proper functioning. The book is written in a clear easy style. Illustrations and drawings are outstanding and easily interpreted. I highly recommend this book for teaching students of anatomy and feel it would be an excellent reference source for all physical therapists and those interested in anatomic functions.

LT. COMDR. MAURINE M. MECKES, MSC, USN

NEUROLOGIC EXAMINATION OF THE DOG, With Clinicopathologic Observations, by *John T. McGrath*, V.M.D. 2d edition, thoroughly revised. 281 pages; illustrated. Lea & Febiger, Philadelphia, Pa., 1960. Price $7.

This book is a most welcome contribution to the literature of veterinary medicine. Its main object is to present, in basic outline form, neurologic anomalies and nervous disorders that affect dogs. The author writes in an easy to read, concise manner. His definitions and descriptions are clear cut for maximum comprehension by students, practitioners, or investigators in biomedical research. The first part of this volume deals with the neurologic examination of the dog. An excellent explanation is advanced for obtaining an accurate medical history of each case as well as a complete neurologic history to assist in the differential diagnosis of the various nervous disorders. A review of the peripheral nervous system, the central nervous system, the meninges, and the spinal cord is presented with special emphasis on neurophysiology and neuroanatomy. Each reflex utilized in conducting a neurologic examination is competently described, well illustrated, and given clinical evaluation. The remainder of the book deals with virtually all of the nervous diseases and disorders of dogs. Diseases of congenital origin, such as hydrocephalus and epilepsy, are classified through neurologic symptomatology and pathology. Metabolic and toxic disturbances, as well as trauma and injuries to the nervous system, receive due consideration by the

author. Case histories are presented to supplement the descriptions of most of the neurologic diseases, including those of inflammatory and infectious origin. Neoplasms of the central nervous system are awarded special attention. Not only are they well classified, but in most instances, photographs show the dog and the recovered tumor following necropsy. The author's original observations and materials are supported by a most impressive and authoritative bibliography. The investigator, student, or practitioner can find no better basic information on the neurologic examination of the dog. This well-organized review of the nervous disorders affecting dogs should be studied by every veterinarian engaged in small-animal practice.

COL. HARRY A. GORMAN, USAF, VC

EMOTIONAL FORCES IN THE FAMILY, edited by *Samuel Liebman*, M.D. 157 pages. J. B. Lippincott Co., Philadelphia, Pa., 1959. Price $5.

This volume is the fifth in an annual series based upon lectures given at the North Shore Hospital, Winnetka, Illinois. All royalties are assigned to the American Psychiatric Association. The general title emphasizes that a patient does not operate in a vacuum and is confronted with new roles as he is involved in significant interpersonal relationships, from his own infancy to his dotage. Topics are discussed in a generally nontechnical manner, by workers who have been especially interested in this aspect of psychiatry. They include the role of the mother in the family, the emotional impact of in-laws, the "Boss," and the "disintegrating impact" of modern life. The writing tends to be quite uniform in style, suggesting extensive editing. But the main theses are expressed clearly and pungently and call our attention to the rapidly changing social scene in our complex industrialized and mobile society. These factors are especially important to a military psychiatrist when it is realized that a majority of our patients give a history of broken homes, through divorce, death, or separation, with the attendant problems of failure in identification, lack of emotional gratification, and confusion of role patterning. Each chapter has a bibliography. The book is well printed in an easily read format. It is highly recommended for psychiatrists and workers in ancillary fields.

CAPT. FELIX H. OCKO, MC, USN

CARDIAC RESUSCITATION, edited by *J. Willis Hurst*, M.D. 141 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1960. Price $5.50.

This little monograph is the re-editing of a symposium on the subject held at the Grady Memorial Hospital, Atlanta, Georgia, in which J. Willis Hurst, M.D., was the moderator. Herbert R. Karp, M.D., reviews basic physiologic principles involved; Paul M. Zoll, M.D., reviews cardiac resuscitation from the standpoint of the internist; David S. Leighninger, M.D., discusses cardiac arrest from the surgeon's point of view; Thomas J. DeKornfeld, M.D., discusses respiratory resuscitation in connection with cardiac resuscitation; John E. Steinhaus, M.D., discusses the role of anesthetic drugs and errors in cardiac arrest; Henry L. Bowden, Ll.B., resuscitation as viewed by a lawyer; and Charles V. Gerkin, B.D., chaplain, Grady Memorial Hospital, resuscitation as viewed by a theologian. It is an excellent and practical discussion of the whole subject of cardiac resuscitation. The last section is a chapter of questions and answers by the panel. The whole monograph has helped us immeasurably in re-editing our own hospital procedures in the emergency room, the operating room, and on the wards. It is a most welcome publication for all emergency services, particularly in the medium-sized and smaller hospitals. It would also be valuable to all those teaching first aid and providing professional guidance for rescue services.

COL. WILLIAM D. PRESTON, USAF, MC

AN ATLAS OF NEUROSURGICAL TECHNIQUES, by *James L. Poppen*, M.D. 522 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1960. Price $28.

Originally, it was planned to review this book by discussing each section and subsection. This proved so lengthy as to be impractical. In consequence, examples of its strengths and weaknesses will be cited to present the basis for the evaluation presented here. The surgical management of tic douloureux is thoroughly covered, including all the lesser procedures that are so often used before an intracranial operation must be undertaken. The illustrations in this particular section are adequate, abundant, and instructive up to and including the temporal approach for section of the trigeminal nerve. The operative technic for the removal of intracranial tumors is adequately displayed, with helpful comments appended to the illustrations. The detailed depictions of the numerous solutions to the problems posed by meningiomas in all their varied locations are lucid and adequate. The section that covers autonomic surgery is beautifully illustrated in a clear, unequivocal fashion and should enable any surgeon who follows the suggested course to accomplish the desired procedure. The management of malignant exophthalmos by orbital decompression is thoroughly shown in a clear-cut manner, with many little fine points of the procedure brought to the reader's attention. Not all of the book, however, is so instructive. The section on peripheral nerve surgery has serious limitations. The incisions shown often are not adequate to enable the necessary surgery to be accomplished. The author pictures a technic of nerve suture in which "a needle [is] inserted through the central portion of the cephalad and caudal sections of the nerve." To do such a thing even with the finest of needles is only to add new nerve damage and to violate the principles of management of peripheral nerve injury that have been learned successively in past wars. The illustrations depicting sections of the lower cranial nerves are inaccurate to the point of being misleading. In the section devoted to management of intracranial aneurysms, the basic diagrammatic representation of the circle of Willis is in error: namely, the posterior communicating artery is shown arising from the middle cerebral artery, an uncommon point of origin, and the posterior cerebral artery is shown coursing under the anterosuperior cerebellar artery, which, in turn, is shown as serving the temporal lobe. The section on cerebral trauma includes only the management of scalp lacerations, depressed fractures, and subdural and epidural hematomas. The problems of penetrating and perforating missile injuries, and compound skull injuries with consequent brain damage are not touched upon. In summary, although there are many good sections in this book, too often these are not detailed enough to enable a surgeon not familiar with neurosurgery to utilize them. The bad features are such that the neophyte in the field of neurosurgery would have to have a guide and mentor to enable him to avoid the pitfalls into which this volume would lead him. LT. COL. GEORGE J. HAYES, MC, USA

THE OLDER PATIENT, by 21 authors, edited by *Wingate M. Johnson*, M.D. 589 pages; illustrated. Paul B. Hoeber, Inc., New York, N.Y., 1960. Price $14.50.

"A light he was to no one but himself/Where now he sat, concerned with he knew what,/A quiet light, and then not even that." This line from Frost's description of an aged man is of the same stuff as this book is made of. I must confess to a certain apprehension when I first thumbed through it, noting a multiplicity of contributors from many specialities. Although a prevalent technic of "book making," it is one in which the inherent problems of synthesis and organization occasionally overwhelm those involved, however talented. In this case this judgment was premature; it is a thoroughly good book. It suffers

from none of the publishing syndromes to which multi-authored volumes are peculiarly susceptible; for example, reduplication and uneven development of parts, discoordination of content, nystagmus of purpose, dysrhythmia of style, regurgitation of previously digested material, logorrhea—to mention but a few. The volume was 2 years in the writing, but one suspects that the concept of it matured over many more in the mind of the editor through whose propitious influence the efforts of many men were brought to harmonious fruition. A striking feature of this volume is its concentration on its avowed purpose: the problems of the old, the vagaries of their illness, and their changing status in society. The deteriorating socioeconomic role of our senior citizens is well described in the later chapters and the fitting conclusion is devoted to the ways and means of helping them to adjust to the whole of their somewhat discouraging situation. It may be argued of course that the degraded role of our elders is not a just one; a poor reward for those worn out by a productive effort. Is not the position and prestige accorded the "have beens" a mirror in which society, like Dorian Gray, can see its moral substance? If society requires that we "take the cash and let the credit go," what other long term tenets of moral life must we sacrifice? Does not this social myopia feed the grasping pseudopod of malignant materialism and make it more hungry, reducing tomorrow to the dunning of the finance company for the joys of yesterday? This new book does not supply the answers to these questions but gives clear insight into the problems that exist today and the ways one can deal with them. Depending on one's feeling in the matter, the suggestions will sound to a greater or lesser degree platitudinous, but the authors deal as well as can be expected with a subject in which there is a gap between what is and what might better be. The scope of the volume is great. There are chapters on general topics of diagnostic rapport, the biology of aging, nutrition, preoperative and postoperative evaluation and care, the relief of pain, and the broad therapeutic approach, as well as a cogent discussion of disease entities by systems. The index is notably complete and the bibliography shows discriminating selection of the better pertinent articles, many of which are current. The distressing habit of referencing one's own bibliography has been largely avoided. The reader should not expect the detailed elaboration of symptoms and signs of each entity that one finds in the classic medical texts, because this book has avoided the boredom of such repetition, directing its effort to pointing up the variations and nuances in disease syndromes as seen in the aged. Thus the intention of the volume is undiluted and becomes, thereby, a vehicle through which much wisdom as well as fact is conveyed. This is the essential feature of the book. It is wisely written and would be wisely read.

LT. COMDR. ROBERT E. DE FOREST, MC, USN

THE PROFESSION OF PHARMACY, An Introductory Textbook, by *Richard A. Deno, Thomas D. Rowe* and *Donald C. Brodie*. 256 pages; illustrated. J. B. Lippincott Co., Philadelphia, Pa., 1959. Price $6.50.

This text has several handicaps—all seemingly related to the situation that the book was written to meet the demands of one required course in one school of pharmacy. Such limits are restrictive and would tend to make any book parochial in scope. Such has been the fate of this textbook. Flora, fauna, man, and his foibles are all mentioned in their relationships to pharmacy. With such a wide scope of coverage, each item is treated lightly. The text will be of little use as a reference book. In my opinion this work will reside on the library shelves of schools of pharmacy for long periods of time with only rare interruptions of hasty thumbing through.

CAPT. EDWARD J. HUYCKE, MC, USA

MANUAL OF SKIN DISEASES, by *Gordon C. Sauer*, M.D. 269 pages; illustrated. J. B. Lippincott Co., Philadelphia, Pa., 1960. Price $9.75.

Written primarily for the general practitioner, this short book on common skin diseases in dermatology may serve to improve the quality of dermatologic service generally available in the office of the nonspecialist. However, previous attempts to simplify the subject of dermatology have not been well received by the profession. Compared with the manual published during World War II by Pillsbury, Sulzberger and Livingood—primarily for use of the nonspecialist in the military service—this book will probably enjoy much less popularity. The manual is replete with excellent black-and-white illustrations of common dermatologic conditions. However, most of these are available in the standard, authoritative dermatologic textbooks. Unfortunately too, the employment of many color plates, all from commercial drug houses, would appear to be in questionable taste, especially in this day and time. Also, these color plates are undoubtedly quite old and the color reproduction is not especially good. The book is well written and readable. The author's storybook style of relating many of his case presentations and the therapeutic management initially and on subsequent visits adds an element of interest. A 30-page dictionary-index, defining and classifying some of the rarer dematologic terms not covered in the main section, will be especially useful as an outline of study for candidates taking their examinations before the American Board of Dermatology.

COL. CLAUDE B. WHITE, USAF, MC

CARDIAC AUSCULTATION, Including Audio-Visual Principles, by *J. Scott Butterworth*, M.D., *Maurice R. Chassin*, M.D., *Robert McGrath*, M.D., and *Edmund H. Reppert*, M.D. 102 pages; illustrated Grune & Stratton, Inc., New York, N.Y., 1960. Price $6.25.

Doctors Butterworth, Chassin, McGrath, and Reppert have turned out a compact, well printed, and excellently indexed book on cardiac auscultation with special emphasis on audiovisual aids to auscultation. As a matter of fact, this represents the second edition of an original work similarly titled and copyrighted in 1955. A principal use of this book has been as a teaching aid for a postgraduate course in cardiac auscultation that is conducted periodically at the New York University Post-Graduate Medical School. In this particular postgraduate course generous use is made of what is known as an educational cardioscope. This cardioscope functions mainly via a 17-inch oscilloscope fluorescent screen that allows the simultaneous visualization of a stethogram and electrocardiogram. Concomitant with these two visual aids the cardioscope also has amplifying attachments that make it possible for student groups to use individual electric stethoscopes simultaneously and to hear the actual heart sounds of the same patient whose electrocardiogram and stethogram is fluorescing on the oscilloscope screen. The book includes descriptions of the normal and abnormal heart sounds of all the common disorders, such as valvular stenosis, valvular insufficiency, septal defects, and shunts from patent ductus. These are shown by means of well-illustrated photographs of stethograms and simultaneously recorded electrocardiograms or carotid pulse curves. For students attending such a course on auscultation including electric audiovisual equipment this book would be of inestimable value. Likewise it would be extremely valuable to medical students, interns, and residents in any school or hospital where audiovisual technics are used for instruction in physical diagnosis. For the casual reader or practitioner it makes interesting reading, but is not so pertinent as it is to these other participant student audiences.

COL. FRANK L. BAUER, MC, USA

New Books

Books received by the U.S. ARMED FORCES MEDICAL JOURNAL *are listed in this department for the information of readers, and as acknowledgment and appreciation of their receipt from the publishers. Those of greatest interest will be selected for review in a subsequent number of the* JOURNAL.

A MANUAL OF TROPICAL MEDICINE, by *George W. Hunter, III*, Ph.D., Col. U.S.A., (Ret.), *William W. Frye*, Ph. D., M.D., Sc. D. (Hon.), and *J. Clyde Swartzwelder*, Ph. D., with 33 collaborators. 3d edition. 892 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1960. Price $15.

SURGICAL ANATOMY OF THE BRONCHOVASCULAR SEGMENTS, by *William E. Bloomer*, M.D., *Averill A. Liebow*, M.D., and *Milton R. Hales*, M.D., with a foreword by *Gustaf E. Lindskog*, M.D. 273 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1960. Price $16.50.

FUNDAMENTALS OF MODERN ALLERGY, edited by *Samuel J. Prigal*, M.D. Sponsored by the New York Allergy Society. 690 pages; illustrated. The Blakiston Division, McGraw-Hill Book Co., Inc., New York, N.Y., 1960. Price $18.50.

THE CENTRAL NERVOUS SYSTEM AND BEHAVIOR, Transactions of the Second Conference, February 22, 23, 24, and 25, 1959, Princeton, N.J., edited by *Mary A. B. Brazier*, Ph. D. Sponsored by the Josiah Macy, Jr. Foundation, New York, N. Y., with the cooperation of The National Science Foundation, Washington, D.C. 358 pages; illustrated. Josiah Macy, Jr. Foundation, New York, N.Y., 1959. Price $4.75.

RECENT ADVANCES IN PUBLIC HEALTH, by *J. L. Burn*, M.D., D. Hy., D.P.H. 2d edition. 370 pages; illustrated. Little, Brown & Co., Boston, Mass., 1959. Price $10.

HISTOCHEMISTRY, Theoretical and Applied, by *A. G. Everson Pearse*, M.A., M.D., Cambridge, M.R.C.P., D.C.P. London. 2d edition. 998 pages; illustrated. Little, Brown & Co., Boston, Mass., 1960. Price $20.

THE NEW FRONTIER, Man's Survival in the Sky, by *K. G. Williams*. 161 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1959. Price $5.50.

READING DISABILITY, A Medical Study of Word-Blindness and Related Handicaps, by *Knud Hermann*, M.D. 183 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1959. Price $5.50.

SIMPLIFIED ARITHEMTIC FOR NURSES, by *M. Esther McClain*, R.N., M.S., 2d edition, revised. 150 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1960. Price $2.

INTUSSUSCEPTION IN INFANTS AND CHILDREN, by *Mark M. Ravitch*, M.D. 119 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1959. Price $9.

ELONGATION TREATMENT OF LOW BACK PAIN, by *George H. Hassard*, M.D., and *Charles L. Redd*, B.S., P.T., with forewords by *Harvey E. Billig, Jr.*, M.D., F.I.C.S., F.A.C.S.M., and *B. S. Minsker*. 78 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1959. Price $4.50.

ADVANCES IN SPACE SCIENCE, edited by *Frederick I. Ordway, III*, and an editorial advisory board. Vol. 1, 1959. 412 pages; illustrated. Academic Press Inc., New York, N.Y., 1959. Price $12.

BIOLOGICAL PROBLEMS OF GRAFTING, A Symposium sponsored by the Commission Administratie Du Patrimoine Universitaire De Liège and the Council For International Organizations of Medical Sciences, organized and edited by the Laboratory of Experimental Surgery of the University of Liège by Professor *F. Albert* and Dr. *G. Lejeune-Ledant*, 18th-21st March 1959. 453 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1959. Price $12.50.

A PRACTICE OF ANAESTHESIA, by *W. D. Wylie*, M.A., M.B. (Cantab.), M.R.C.P., F.F.A.R.C.S., and *H. C. Churchill-Davidson*, M.A., M.D. (Cantab.), F.F.A.R.C.S. 1,056 pages; illustrated. Year Book Publishers, Inc., Chicago, Ill., 1960. Price $20.

THE PRINCIPLES AND PRACTICE OF ELECTROTHERAPY AND ACTINOTHERAPY, by *Byran O. Scott*, M.R.C.S., L.R.C.P., D. Phys. Med. 314 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1959. Price $7.50.

MEDICAL TERMS, Their Origin and Construction, by *Ffrangcon Roberts*, M.A., M.D., F.F.R. 3d edition, revised and enlarged. 92 pages. Charles C Thomas, Publisher, Springfield, Ill., 1959. Price $3.

ESSENTIALS OF ORTHOPAEDICS, by *Philip Wiles*, M.S. (Lond.), F.R.C.S. (Eng.), F.A.C.S. 3d edition. 576 pages; illustrated. Little, Brown & Co., Boston, Mass., 1959. Price $13.

CANCER AND ALLIED DISEASES OF INFANCY AND CHILDHOOD, edited by *Irving M. Ariel*, M.D., and *George T. Pack*, M.D., with 27 contributing authors. 605 pages; illustrated. Little, Brown & Co., Boston, Mass., 1960. Price $22.50.

THE HAUNTING MELODY, Psychoanalytic Experiences in Life and Music, by *Theodor Reik*. 376 pages. Grove Press, Inc., New York, N.Y., 1960. Price $2.45.

MICROBIOLOGY FOR NURSES, by *Martin Frobisher*, S.B., Sc. D., and *Lucille Sommermeyer*, R.N., B.S., Ed. M. 10th edition. 562 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1960. Price $5.

LABORATORY MANUAL OF BIOCHEMISTRY, by *Benjamin Harrow, Ernest Borek, Abraham Mazur, Gilbert C. H. Stone*, and *Harry Wagreich*. 5th edition. 169 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1960. Price $3.25.

MITRA OPERATION FOR CANCER OF THE CERVIX, Extraperitoneal Pelvic Lymphadenectomy and Radical Vaginal Hysterectomy, by *Subodh Mitra*, M.B. (Cal.), Dr. med. (Berlin), F.R.C.S. (Edin.), F.R.C.O.G., F.A.C.S., F.N.I., with a foreword by Prof. Dr. *Robert Schroeder*. 93 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1960. Price $6.

INTERPERSONAL RELATIONSHIPS IN THE HOSPITAL, by *Warner F. Bowers*, A.B., B. Sc., M.D., M. Sc., Ph. D. (Surg). 125 pages. Charles C Thomas, Publisher, Springfield, Ill., 1960. Price $5.

CLINICAL OBSTETRICS AND GYNECOLOGY, Advances in Gynecologic Surgery, edited by *S. B. Gusberg*, M.D. Cesarean Section, edited by *Edwin J. De Costa*, M.D. Vol. 2, No. 4. 1,228 pages; illustrated. Paul B. Hoeber, Inc., New York, N.Y., 1959. Price $18 (4 quarterly issues).

THE YEAR BOOK OF DRUG THERAPY (1959–1960 Year Book Series), edited by *Harry Beckman*, M.D. 570 pages. Year Book Publishers, Inc., Chicago, Ill., 1960. Price $8.50.

BONE AS A TISSUE, edited by *Kaare Rodahl*, M.D., *Jesse T. Nicholson*, M.D., and *Ernest M. Brown, Jr.*, M.D. 358 pages; illustrated. McGraw-Hill Book Co., Inc., New York, N.Y., 1960. Price $16.

POLYSACCHARIDES IN BIOLOGY, Transactions of the Fourth Conference, May 21, 22, and 23, 1958, Princeton, N.J., edited by *Georg F. Springer*, M.D. Sponsored by the Josiah Macy, Jr. Foundation, New York, N.Y. 1959. Price $5.95.

RESEARCH CONFERENCE ON THERAPEUTIC COMMUNITY, Held at Manhattan State Hospital, Ward's Island, New York, compiled and edited by *Herman C. B. Denber*, M.D. 265 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1960. Price $11.

DRUGS OF CHOICE, 1960–1961, edited by *Walter Modell*, M.D. 958 pages; illustrated. C. V. Mosby Co., St. Louis, Mo., 1960. Price $13.50.

INTERNAL MEDICINE IN DENTAL PRACTICE, by *Leon H. Collins, Jr.*, A.B., M.D., F.A.C.P., F.C.C.P., and *Martin P. Crane*, B.S., M.D., Sc. D. (Hon.). 5th edition, thoroughly revised. 555 pages; illustrated. Lea & Febiger, Philadelphia, Pa., 1960. Price $8.50.

TEXTBOOK OF OTOLARYNGOLOGY, by *David D. DeWeese*, M.D., and *William H. Saunders*, M.D. 464 pages; illustrated. C. V. Mosby Co., St. Louis, Mo., 1960. Price $8.75.

THE YEAR BOOK OF OPHTHALMOLOGY (1959–1960 Year Book Series), edited by *William F. Hughes*, M.D. 406 pages; illustrated. Year Book Publishers, Inc., Chicago, Ill., 1960. Price $8.

CHEMICAL MICROMETHODS IN CLINICAL MEDICINE, by *R. H. Wilkinson*, M.A., M.D. 121 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1960. Price $5.

EMERGENCIES IN MEDICAL PRACTICE, edited by *C. Allan Birch*, M.D., F.R.C.P. 6th edition. 751 pages; illustrated. Williams & Wilkins Co., Baltimore, Md., 1960. Price $8.50.

BASIC OFFICE DERMATOLOGY, by *Stuart Maddin*, M.D., *Julius L. Danto*, M.D , *William D. Stewart*, M.D., F.R.C.P. (C), with forewords by Dr. *R.F. Farquharson*, M.D., and *M.B. Sulzberger*, M.D. 308 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1960. Price $11.75.

TREATMENT OF URINARY LITHIASIS, compiled and edited by *Arthur J. Butt*, B.S., M.D., F.A.C.S. 577 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1960. Price $21.

EMOTIONAL FORCES IN THE FAMILY, edited by *Samuel Liebman*, M.D. 157 pages. J. B. Lippincott Co., Philadelphia, Pa., 1959. Price $5.

BACK PAIN, Diagnosis and Treatment Using Manipulative Techniques, by *John McM. Mennell*, M.D. 226 pages; illustrated. Little, Brown & Co., Boston, Mass., 1960. Price $9.50.

ZABRISKIE'S OBSTETRICS FOR NURSES, by *Elise Fitzpatrick*, R.N., M.A., and *Nicholson J. Eastman*, M.D. 10th edition. 571 pages; illustrated. J. B. Lippincott Co., Philadelphia, Pa., 1960. Price $6.

NEW AND NONOFFICIAL DRUGS, An Annual Compilation of Available Information on Drugs, Including Their Therapeutic, Prophylactic and Diagnostic Status, as Evaluated by the Council on Drugs of the American Medical Association. 1960. 768 pages. J. B. Lippincott Co., Philadelphia, Pa., 1960. Price $3.35.

MICROCHEMICAL METHODS FOR BLOOD ANALYSIS, by *Wendell T. Caraway*, Ph. D. 109 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1960. Price $5.25.

CLINICAL ORTHOPAEDICS, edited by *Anthony F. DePalma*, with the assistance of the associate editors, the board of advisory editors and the board of corresponding editors. No. 15, Winter, 1959. 217 pages; illustrated. J. B. Lippincott Co., Philadelphia, Pa., 1959. Price $7.50.

OCULAR VERTICAL DEVIATIONS AND THE TREATMENT OF NYSTAGMUS, by *J. Ringland Anderson*, M.C., M.D., B.S., F.R.C.S.Ed., F.R.A.C.S., D.O.M.S., with a foreword by *Sir Stewart Duke-Elder*, G.C.V.O. 2d edition. 189 pages; illustrated, J. B. Lippincott Co., Philadelphia, Pa., 1959. Price $8.50.

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